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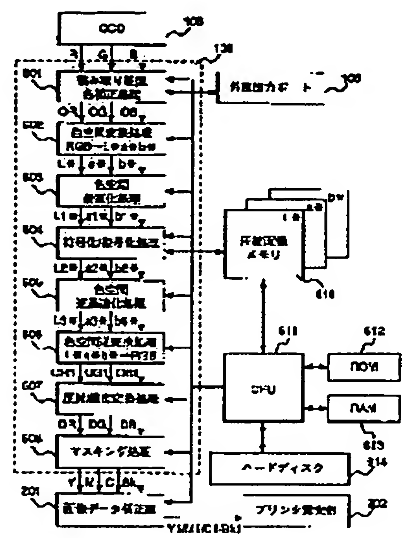
(54) IMAGE PROCESSOR



(57)Abstract:

PURPOSE: To discriminate an image attribute with precision by means of simpler configuration by discriminating the attribute of an image encoded by means of a GBTC system and providing a macro-attribute discriminating means for correcting the discrimination result.

CONSTITUTION: After encoding through the use of the GTBC system is executed to image data of an original which is expressed by L*a*b color specification system, data is temporarily stored in a compression image memory 610. Sign data stored in the memory 610 is read and an attribute discriminating processing is executed. The respective flag values are set in accordance with the discrimination result and the flag values are stored in the memory 610 as attribute information. Then, the result of the attribute discrimination processing is investigated at every block based on the relation of a block attribute with the respective blocks in a prescribed range with the block as a center and a macro-attribute discrimination processing for correcting attribute information of the erroneously discriminated block is executed. Based on the discrimination result, encoding data is compressed again and stored in the memory 610 together with the flag which expresses the attribute.

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CLAIMS

[Claim(s)]
[Claim 1] The image processing system characterized by providing the following. The data-conversion processing section which changes the RGB image data of a manuscript into the data of a lightness component, and the data of a chromaticity component Average information which divides equally the sum of the average Q4 of the data of the average Q1 of the data of the value not more than parameter P1 which divides the data of a lightness component and a chromaticity component into the block which consists of a predetermined pixel matrix, respectively, and is defined from the data within a block for every block, and the value more than parameter P2 (however, it has the relation of P1<P2) two, and is searched for The coding processing section which encodes the data of each pixel within a block based on the gradation width-of-face index which is the difference of the above-mentioned average Q4 and the average Q1 to the code data quantized and obtained on gradation level fewer than the aforementioned data within the limits of the gradation distribution within the block concerned An attribute distinction means to distinguish the attribute of the picture to which the block concerned belongs about the block with which coding processing was performed based on the average information on a lightness component and a chromaticity component, a gradation width-of-face index, and the value of code data, Based on the distinction result in the above-mentioned attribute distinction means of the block of 1, and the block which is within the limits of predetermined [centering on the block concerned], per block with a macro attribute distinction means to correct the distinction result of the block concerned The decryption processing section which decrypts code data per block based on the storage section which memorizes average information, a gradation width-of-face index, code data, and the attribute distinction result by the macro attribute distinction means, the average information memorized by the storage section, and a gradation width-of-face index
[Claim 2] The image processing system characterized by providing the following. The data-conversion processing section which changes the RGB image data of a manuscript into the data of a lightness component, and the data of a chromaticity component Average information which divides equally the sum of the average Q4 of the data of the average Q1 of the data of the value not more than parameter P1 which divides the data of a lightness component and a chromaticity component into the block which consists of a predetermined pixel matrix, respectively, and is defined with the data within a block for every block, and the value more than parameter P2 (however, it has the relation of P1<P2) two, and is searched for The coding processing section which encodes the data of each pixel within a block based on the gradation width-of-face index which is the difference of the above-mentioned average Q4 and the average Q1 to the code data quantized and obtained on gradation level fewer than the aforementioned data within the limits of the gradation distribution within the block concerned An attribute distinction means to distinguish the picture attribute to which the block concerned belongs about the block with which coding processing was performed based on the average information on a lightness component and a chromaticity component, a gradation width-of-face index, and the value of code data, A macro attribute distinction means to correct the distinction result of the block concerned based on the distinction result in the above-mentioned attribute distinction means of the block of 1, and the block which is within the limits of predetermined [centering on the block concerned], The

compression processing section which performs compression processing which cuts down the data which can always be specified based on the attribute of the average information on a lightness component and a chromaticity component, a gradation width-of-face index, and the picture corrected by the macro attribute distinction means among code data, The storage section which remembers an attribute distinction result to be data after compression processing, and the data and the attribute distinction result after the compression processing memorized by the storage section are read. The decryption processing section which decrypts code data per block based on the compressed data extension processing section which restores the data cut down in compression processing based on the attribute distinction result, the average information on the lightness component elongated in the data extension processing section, and a chromaticity component, and a gradation width-of-face index

[Claim 3] In any one image processing system indicated by the claim 1 or the claim 2 the above-mentioned attribute distinction means The distinction processing which will be distinguished if the block concerned belongs to a poor picture when all the values of the gradation width-of-face index of the lightness component of the block to distinguish and a chromaticity component are below predetermined values, When the value of the gradation width-of-face index of a lightness component and a chromaticity component has at least one value beyond the above-mentioned predetermined value When the average information on the chromaticity component of the block further distinguished from the distinction processing which will be distinguished if the block picture concerned belongs to the picture which has two or more gradation is below predetermined value with both another above When the value of the distinction processing which will be distinguished if the block concerned belongs to monochrome picture, and the average information on a chromaticity component is beyond predetermined value with the another above When the value of the code data assigned to the lightness component of the block distinguished from the distinction processing which will be distinguished if it belongs to a color picture polarizes two times, the block concerned the block concerned It will distinguish, if it belongs to a binary picture, and it is the image processing system characterized by performing at least one of the distinction processings which will be distinguished if the block concerned belongs to a multiple-value picture when not polarizing the above-mentioned two.

[Claim 4] It is the image processing system indicated by any one of a claim 1 or the claims 3. Furthermore, before decrypting code data per block in the coding processing section It asks for the histogram of the average information on the lightness component of all blocks of the attribute or a lightness component, and a chromaticity component according to the attribute of the block concerned. The image processing system characterized by having an average information transform-processing means to change the value of the average information on each block into a proper value, based on the histogram for which it asked.

[Claim 5] In the image processing system indicated by any one of a claim 1 or the claims 3 Per [section / storage] block, furthermore, the average information on a lightness component and a chromaticity component, The image processing system which reads a gradation width-of-face index, code data, and an attribute distinction result, and is characterized by having edit/processing processing section which changes beforehand the average information on the corresponding component, a gradation width-of-face index, and the value of code data into a constant value based on the read attribute distinction result.

[Translation done.]

* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention relates to the image processing system which performs compression coding of image information using a GBTC (Generalized Block Truncation Coding) method.
[0002]
[Description of the Prior Art] In image processing systems, such as a digital copier, the attribute of the picture of a manuscript is distinguished and there are some which perform air entrainment which rationalizes the concentration distribution of the picture reproduced on a form, color conversion, edit/processing processing of the picture of frame edit, etc. based on the distinguished result. For example, the equipment which performs attribute distinction processing based on the data of each pixel or the data within the predetermined pixel matrix containing an attention pixel is known by once memorizing the equipment which the data of the picture of a manuscript read, simultaneously samples the read image data concerned, performs a high-speed operation, and performs attribute distinction processing on real time, and the read data of a manuscript in memory. Moreover, based on the information acquired by performing coding processing of a GBTC method to the image data of a manuscript, the image processing system which distinguishes the attribute of a picture for every block is proposed. In coding processing of a GBTC method, the image data of a manuscript is extracted for every block of a predetermined pixel matrix. The average Q1 and the parameter P2 (however, the relation of P1<P2 is filled.) of data not more than parameter P1 which are defined from the data within a block for every block The sum of the average Q4 of the data of the above value is based on the gradation width-of-face index LD which is the difference of the average information LA and the above-mentioned average Q4 which are divided equally and calculated, and the average Q1 two. Compression coding of the data of each pixel within a block is carried out at code data phiij which quantizes on gradation level fewer than the aforementioned data, and is obtained within the limits of the gradation distribution within the block concerned. Thus, the average information LA, the gradation width-of-face index LD, and code data phiij which are obtained by coding processing of a GBTC method are data reflecting the average, gradation width of face, etc. of data of each pixel which constitutes a block. The image processing system by which the proposal is made [above-mentioned] distinguishes the attribute of a picture for every block based on the information acquired from the above-mentioned data using this property.
[0003]
[Problem(s) to be Solved by the Invention] In the case of the equipment which the data of the above-mentioned manuscript read, simultaneously performs attribute distinction processing on real time, the number and its content of processing of the image data which can be sampled are restricted on account of the operation speed of equipment. Moreover, mass memory is needed and the equipment which once memorizes the data of a picture in memory and performs attribute distinction processing based on the data of each pixel takes the great operation time, in order to perform data processing about each pixel. Furthermore, image data is once memorized in memory, and in order to acquire the information on a wide range circumference picture based on the data within the predetermined pixel matrix containing an attention pixel in the case of the equipment

which performs attribute distinction processing, very many line buffers are needed. Moreover, in the case of the image processing system which judges the attribute of a picture for every block, based on the information acquired by coding processing of a GBTC method, there is a problem that it is judged by the attribute which much picture blocks mistook according to various factors of bleeding of the color in the edge portion of the character picture generated with the fall of the resolution by the reading precision of image data etc., the chromatic aberration of the lens in a color picture reader, etc.

[0004] The purpose of this invention is easier composition and is offering the image processing system which distinguishes the attribute of a picture with a sufficient precision.

[0005]

[Means for Solving the Problem] The data-conversion processing section which changes the RGB image data of a manuscript into the data of a lightness component, and the data of a chromaticity component in the 1st image processing system of this invention, The data of a lightness component and a chromaticity component are divided into the block which consists of a predetermined pixel matrix, respectively. The average Q1 and the parameter P2 of data of a value not more than parameter P1 which are defined from the data within a block for every block The sum of the average Q4 of the data of the above value two The average information divided equally and searched for, (However, it has the relation of P1<P2) It is based on the gradation width-of-face index which is the difference of the above-mentioned average Q4 and the average Q1. the data of each pixel within a block The coding processing section encoded to the code data quantized and obtained on gradation level fewer than the aforementioned data within the limits of the gradation distribution within the block concerned, An attribute distinction means to distinguish the attribute of the picture to which the block concerned belongs based on the average information on the lightness component of a block, and a chromaticity component that coding processing was performed, a gradation width-of-face index, and the value of code data, Based on the distinction result in the above-mentioned attribute distinction means of the block of 1, and the block which is within the limits of predetermined [centering on the block concerned], per block with a macro attribute distinction means to correct the distinction result of the block concerned Based on the storage section which memorizes average information, a gradation width-of-face index, code data, and the attribute distinction result by the macro attribute distinction means, the average information memorized by the storage section, and a gradation width-of-face index, it has the decryption processing section which decrypts code data per block.

[0006] The data-conversion processing section which changes the RGB image data of a manuscript into the data of a lightness component, and the data of a chromaticity component in the 2nd image processing system of this invention, The data of a lightness component and a chromaticity component are divided into the block which consists of a predetermined pixel matrix, respectively. The average Q1 and the parameter P2 of data of a value not more than parameter P1 which are defined with the data within a block for every block The sum of the average Q4 of the data of the above value two The average information divided equally and searched for, (However, it has the relation of P1<P2) The coding processing section which encodes the data of each pixel within a block based on the gradation width-of-face index which is the difference of the above-mentioned average Q4 and the average Q1 to the code data quantized and obtained on gradation level fewer than the aforementioned data within the limits of the gradation distribution within the block concerned, An attribute distinction means to distinguish the picture attribute to which the block concerned belongs based on the average information on a block that coding processing was performed, a gradation width-of-face index, and the value of code data, A macro attribute distinction means to correct the distinction result of the block concerned based on the distinction result in the above-mentioned attribute distinction means of the block of 1, and the block which is within the limits of predetermined [centering on the block concerned], The compression processing section which performs compression processing which cuts down the data which can always be specified based on the attribute of the average information on a lightness component and a chromaticity component, a gradation width-of-face index, and the picture corrected by the macro attribute distinction means among code data, The storage section which remembers an attribute

distinction result to be data after compression processing, and the data and the attribute distinction result after the compression processing memorized by the storage section are read. The compressed data extension processing section which restores the data cut down in compression processing based on the attribute distinction result, Based on the average information on the lightness component elongated in the data extension processing section, and a chromaticity component, and a gradation width-of-face index, it has the decryption processing section which decrypts code data per block.

[0007] In the above 1st or the 2nd image processing system desirably The distinction processing which will be distinguished if the block concerned belongs to a poor picture when all the values of the gradation width-of-face index of the lightness component of the block which distinguishes the above-mentioned attribute distinction means, and a chromaticity component are below predetermined values, When the value of the gradation width-of-face index of a lightness component and a chromaticity component has at least one value beyond the above-mentioned predetermined value When the average information on the chromaticity component of the block further distinguished from the distinction processing which will be distinguished if the block picture concerned belongs to the picture which has two or more gradation is below predetermined value with both another above When the value of the distinction processing which will be distinguished if the block concerned belongs to monochrome picture, and the average information on a chromaticity component is beyond predetermined value with the another above When the value of the code data assigned to the lightness component of the block distinguished from the distinction processing which will be distinguished if it belongs to a color picture polarizes two times, the block concerned the block concerned In distinguishing if it belongs to a binary picture, and not polarizing [above-mentioned] two, the block concerned performs at least one of the distinction processings which will be distinguished if it belongs to a multiple-value picture. Moreover, in the image processing system of one of the above, desirably, before decrypting code data per block in the coding processing section, based on the histogram which asked for and asked for the histogram of the average information on the lightness component of all blocks of the attribute or a lightness component, and a chromaticity component according to the attribute of the block concerned, it has further an average information transform-processing means to change the value of the average information on each block into a proper value. Moreover, desirably, per [section / storage] block, the average information on a lightness component and a chromaticity component, a gradation width-of-face index, code data, and an attribute distinction result are read, and it has edit/processing processing section which changes beforehand the average information on the corresponding component, a gradation width-of-face index and the value of code data, or the value of the data decrypted in the decryption processing section into a constant value further based on the read attribute distinction result.

[0008]

[Function] In the 1st image processing system of the above, an attribute distinction means distinguishes the attribute of the picture to which the block concerned belongs based on the average information on a lightness component and a chromaticity component, a gradation width-of-face index, and the value of code data. And a macro attribute distinction means corrects the distinction result of the block concerned based on the distinction result in the above-mentioned attribute distinction means of the block of 1, and the block which is within the limits of predetermined [centering on the block concerned]. Thereby, not using the image data before coding processing and after a decryption, ** can also distinguish the attribute of a picture with a sufficient precision. Moreover, in order to distinguish an attribute for every block, it becomes possible to acquire finer attribute information.

[0009] Moreover, in the 2nd image processing system, the compression processing section cuts down the average information on the lightness component which can always be specified, or a chromaticity component, a gradation width-of-face index, and the value of code data according to the attribute of the picture of the block concerned among the data encoded by the coding processing section. The storage section memorizes the attribute distinction result corrected by the data after compression processing, and the macro attribute distinction means. Thereby, the

compressibility of image data can be improved sharply.
[0010] In the above 1st and the 2nd image processing system moreover, the above-mentioned attribute distinction means The distinction processing which will be distinguished if the block concerned belongs to a poor picture when all the values of the gradation width-of-face index of the lightness component of the block to distinguish and a chromaticity component are below predetermined values, When the value of the gradation width-of-face index of a lightness component and a chromaticity component has at least one value beyond the above-mentioned predetermined value When the average information on the chromaticity component of the block further distinguished from the distinction processing which will be distinguished if the block picture concerned belongs to the picture which has two or more gradation is below predetermined value with both another above When the value of the distinction processing which will be distinguished if the block concerned belongs to monochrome picture, and the average information on a chromaticity component is beyond predetermined value with the another above When the value of the code data assigned to the lightness component of the block distinguished from the distinction processing which will be distinguished if it belongs to a color picture polarizes two times, the block concerned the block concerned In distinguishing if it belongs to a binary picture, and not polarizing [above-mentioned] two, the block concerned becomes possible [performing at least one of the distinction processings which will be distinguished if it belongs to a multiple-value picture then performing distinction of an attribute effectively]. That is, the picture of a block can distinguish whether they are that it is monochrome binary picture about whether it is a monochrome poor picture and whether it is a color poor picture, that it is monochrome multiple-value picture, or a full color picture by putting the above-mentioned distinction processing together. Furthermore, in the above-mentioned coding processing section, before decrypting code data per block It asks for the histogram of the average information on the lightness component of all blocks of the attribute or a lightness component, and a chromaticity component according to the attribute of the block concerned. Based on the minimum value, the maximum, and the average of the histogram for which it asked, have an average information transform-processing means to change the value of the average information on each block into a proper value, or Per [section / storage] block, the average information on a lightness component and a chromaticity component, a gradation width-of-face index, Read code data and an attribute distinction result, and by having edit/processing processing section which changes beforehand the average information on the corresponding component, a gradation width-of-face index, and the value of code data into a constant value based on the read attribute distinction result It becomes possible to perform air entrainment to which the data before coding and after a decryption are not processed, but ** also rationalizes a concentration distribution of a manuscript, and edit/processing processings, such as color conversion and frame edit, and the phenomenon of the storage section and the processing time which are needed for the above-mentioned processing can be realized.
[0011]
[Example] The image processing system of this example is explained in order of the following using an attached drawing.
(1) Coding of the image data based on a GBTC method (2) Composition of a digital color copying machine The composition of a digital color copying machine (2-1) A control panel (2-2) (3) Explanation of an image processing A main routine (3-1) Key input processing (3-2) Repressing processing (3-3) It ****. (3-3-1) an attribute -- distinction processing <3-3-1-1> poor picture distinction processing <3-3-1-2> color / monochrome distinction -- processing <3-3-1-3> binary / multiple-value distinction processing <3-3-1-4> macroscopic attribute distinction processing <3-3-1-4-1> -- Binary attribute macroscopic processing <3-3-1-4-2> monochrome multiple-value attribute macroscopic processing <3-3-1-4-3> full color attribute macroscopic processing (3-3-2) characteristic quantity extraction processing <3-3-2-1> ****** poor picture characteristic-quantity extraction processing <3-3-2-3> monochrome binary picture characteristic-quantity extraction processing [****** characteristic quantity extraction processing <3-3-2-2> color] <3-3-2-4> monochrome multiple-value picture characteristic-quantity extraction processing <3- 3-2-5> full color picture characteristic quantity extraction processing (3-3-3) repressing processing -- <3-3-3-

1> monochrome poor picture repressing processing <3-3-3-2> color poor picture repressing processing <3-3-3-3> -- extension processing from monochrome binary picture repressing processing <3-3-3-4> monochrome multiple-value picture repressing processing (3-4) repressing Extension processing <3-4-1-3> monochrome 2 from the extension processing <3-4-1-2> color poor picture repressing from the extension processing <3-4-1-1> monochrome poor picture repressing from repressing (3-4-1) The extension processing (3-4-2) air entrainment <3-4-2-1> monochrome multiple-value picture air entrainment <3-4-2-2> full color picture air entrainment from extension processing <3-4-1-5> full color picture repressing from extension processing <3-4-1-4> monochrome multiple-value picture repressing from value picture repressing (3-4-3) picture edit / processing processing <3-4-3-1> monochrome poor picture processing [edit/processing processing <3-4-3-2> color poor picture edit / processing] <3-4-3-3> monochrome binary picture edit / ** ****** <3-4-3-4> monochrome multiple value -- picture edit / processing processing <3-4-3-5> full color picture edit / processing processing [0012] (1) By the coding GBTC method of the image data based on a GBTC method The average Q1 and the parameter P2 (however, the relation of P1<P2 is filled.) of data not more than parameter P1 which extract the image data of a manuscript for every block of a predetermined pixel matrix, and are defined from the data within a block for every block The sum of the average Q4 of the data of the above value is based on the gradation width-of-face index LD which is the difference of the average information LA and the above-mentioned average Q4 which are divided equally and calculated, and the average Q1 two. Compression coding of the data of each pixel within a block is carried out at the code data which quantizes on gradation level fewer than the aforementioned data, and is obtained within the limits of the gradation distribution within the block concerned. Drawing 1 is drawing showing the flow of coding processing of the GBTC method which the digital color copying machine of this example performs. By the GBTC method, as shown in drawing 1 (a), the image data of a manuscript picture is extracted per 4x4 pixel block. The image data within the extracted 4x4-pixel block the method which uses and explains drawing 2 below -- coding processing -- carrying out -- data [1 byte per each pixel (=8 bit) of] x -- the image data for 16 pixels (16 bytes, i.e., 128 bits), as shown in drawing 1 (b) 2-bit code data x which classifies 1 byte of average information LA, and the data of each pixel into four stages as well as the gradation width-of-face index LD of 1 byte, and is assigned -- it encodes to a total of 6 bytes (=48 bit) of data for 16 pixels This compresses the amount of data into three eighths. Drawing 1 (c) is drawing where the amount of data of the encoded image data means that it is equivalent to a part for 6 pixels of image data before coding. A decryption of the encoded data is performed by computing 1 byte of image data corresponding to code data 2 bits each based on the gradation width-of-face index LD and the average information LA. In addition, in this example, although the image data of a manuscript is extracted per 4x4 pixel block, it is not limited to this but you may extract a 3x3-pixel block and per 6x6 pixel block. Moreover, it is not limited to what encodes 256 gradation data of each pixel within a block to the code data of four gradation, but you may encode to the code data of two gradation or eight gradation. It is because it is characterized by performing distinction of a picture attribute, and various kinds of image processings based on the distinction result concerned using the average information LA searched for for every block in the image processing system of this invention from the parameters P1 and P2 defined from the data within a block, and the gradation width-of-face index LD so that it may explain in order.

[0013] Drawing 2 is drawing showing coding processing and decryption processing of a GBTC method. (a) of drawing 2 indicates relations with the gradation width-of-face index LD to be Maximum Lmax, the minimum value Lmin, and parameters P1 and P2. From the image data extracted per 4x4 pixel block, predetermined characteristic quantity required for coding is calculated. Characteristic quantity is calculated according to the following operations. First, Maximum Lmax and the minimum value Lmin of image data 8 bits each within a 4x4-pixel block are detected. Next, it asks for the parameter P1 which added one fourth of the differences of Maximum Lmax and the minimum value Lmin to the value of the minimum value Lmin, and the parameter P2 which added three fourths of the above-mentioned differences to the value of the minimum value Lmin. In addition, parameters P1 and P2 are called for according to the operation

of the following "-one number" and "a-two number."
[Equation 1] P1= (Lmax+3Lmin)/4 -- [Equation 2] The average Q1 of the image data of the pixel not more than parameter P1 is calculated among P2= (3 Lmax+Lmin)/4, next the image data of each pixel. Moreover, the average Q4 of the image data of the pixel beyond parameter P2 is calculated among the image data of each pixel. Based on the calculated averages Q1 and Q4, average information LA= (Q1+Q4) / 2, and gradation width-of-face index LD=Q4-Q1 are calculated. Next, the operation of "a-three number" and "a-four number" is performed, and reference values L1 and L2 are defined.
[Equation 3] L1=LA-LD/4 -- [Equation 4] L2=LA+LD/4 -- here, reference values L1 and L2 are used in case image data, 1 byte (8 bits), i.e., 256 gradation, of each pixel, is encoded to code data of 2 bits, i.e., four gradation, with the above-mentioned average information LA It sets in 4x 4-pixel block, and (b) of drawing 2 is the i-th line (however, it is i= 1, and 2, 3 and 4.). It is below the same and is eye the j-th train (however, it is j= 1, and 2, 3 and 4.). the following -- being the same -- it is drawing showing the value of code data phiij assigned according to the data value of the existing pixel Xij According to the value of Pixel Xij, 2-bit code data phiij of the value shown in the next "table 1" is assigned to a detail more.
[Table 1]

第ｉ行目、第ｊ行目にある画素Ｘｉｊの１バイト画像データの存在範囲	割り当てる２ビットの符号データφｉｊ
Ｘｉｊ≦Ｌ１	φｉｊ＝０１
Ｌ１＜Ｘｉｊ≦ＬＡ	φｉｊ＝００
ＬＡ＜Ｘｉｊ≦Ｌ２	φｉｊ＝１０
Ｌ２＜Ｘｉｊ	φｉｊ＝１１

The data encoded by the GBTC method consist of code data for 16 pixels (16x2 bits), a gradation width-of-face index LD of 1 byte each (8 bits), and average information LA.
[0014] As shown in (c) of drawing 2 , in case the encoded data are decrypted, the above-mentioned gradation width-of-face index LD and the average information LA are used. That is, according to the value of code data phiij assigned to the pixel Xij in the i-th line and the j-th line, it transposes to 256 gradation data of the value which shows the data of Xij in the next "table 2."
[Table 2]

第ｉ行目、第ｊ列目の画素Ｘｉｊに割り当てられた２ビット符号データφｉｊの値	置き換える２５６階調データの値を求める式
φｉｊ＝０１	Ｘｉｊ＝ＬＡ－ＬＤ／２＝Ｑ１
φｉｊ＝００	Ｘｉｊ＝ＬＡ－ＬＤ／６ ＝２／３Ｑ１＋１／３Ｑ４
φｉｊ＝１０	Ｘｉｊ＝ＬＡ＋ＬＤ／６ ＝１／３Ｑ１＋２／３Ｑ４
φｉｊ＝１１	Ｘｉｊ＝ＬＡ＋ＬＤ／２＝Ｑ４

[0015] The image data of the pixel Xij (however, i and j are which values of 1, 2, 3, and 4, respectively.) in a 4x4-pixel block is transposed to 256 gradation data of four kinds of values by coding processing and decryption processing of a GBTC method. The decrypted data include a clear error as compared with the data of a subject-copy image. However, the error concerned is the level which cannot be easily conspicuous on human being's visual-sense property, and most quality-of-image degradation is not accepted by the natural picture. By the GBTC method, it is completely restored from the gradation width-of-face index LD contained in the data with which parameters Q1 and Q4 were encoded, and Average LA. For this reason, by the character picture, a black portion is less than [parameter P1], and if a white portion is more than parameter P2, the character picture concerned can be restored completely. The compressibility of data changes with the kinds of manuscript by the JPEG method which encodes using DCT conversion. That is,

although a data compression higher than a GBTC method with little degradation is realized to a natural picture, by the binary picture, CG picture, and the character picture, it may hardly be uncompressible. For this reason, a setup of the capacity of the memory with which an image processing system is equipped is difficult. Data are compressible with fixed compressibility with a GBTC method. For this reason, it has the advantage that a setup of the capacity of the memory with which an image processing system is equipped is easy.
[0016] (2) The block diagram 3 of the composition (2-1) digital color copying machine of a digital color copying machine is a composition cross section of the digital color copying machine of this example. A digital full color copying machine is roughly divided into the picture read station 100 which reads the RGB image data of a manuscript, and the copy section 200. In the picture read station 100, the manuscript laid on manuscript base glass 107 is irradiated with the exposure lamp 101. The reflected light of a manuscript is led to a lens 104 by three mirrors 103a, 103b, and 103c, and carries out image formation by the CCD sensor 105. The exposure lamp 101 and mirror 103a move in the direction of an arrow (the direction of vertical scanning) at the speed V according to the setting scale factor by the scanner motor 102. Thereby, the manuscript laid on manuscript base glass is scanned over the whole surface. Moreover, with movement in the direction of an arrow of the exposure lamp 101 and mirror 103a, Mirrors 103b and 103c are V/2 of speed, and, similarly move in the direction of an arrow (the direction of vertical scanning). After the multiple-value electrical signal of three colors of R, G, and B which are obtained by the CCD sensor 105 is changed into cyanogen (C), MAZENDA (M), yellow (Y), and which [of black (BK)] 8-bit gradation data by the reading signal-processing section 106, it is outputted to the external output port 108 and the copy section 200 by it. In the copy section 200, the image data amendment section 201 performs gradation amendment (gamma amendment) according to the gradation property of a photo conductor to the gradation data inputted. The printer exposure section 202 carries out D/A conversion of the image data after amendment, generates a laser diode driving signal, and makes semiconductor laser emit light by this driving signal. The laser beam generated from the printer exposure section 202 corresponding to gradation data exposes the photo conductor drum 204 by which a rotation drive is carried out through reflecting mirrors 203a and 203b. Before the photo conductor drum 204 received exposure for every copy, it was irradiated with the eraser lamp 211, and it is uniformly charged with the electrification charger 205. If exposure is received in this state, the electrostatic latent image of a manuscript will be formed on the photo conductor drum 204. Only any one of cyanogen (C), a Magenta (M), yellow (Y), and the toner development counters 206a-206d of black (BK) is chosen, and the electrostatic latent image on the photo conductor drum 204 is developed. The developed toner image is imprinted by the tracing paper twisted on the imprint drum 218 by the imprint charger 209 after an excessive charge is removed by the eraser 208 before an imprint. The imprint film is stuck on the front face and the imprint drum 218 rotates counterclockwise at the same speed as the rotational speed of a photo conductor. Moreover, in order to take the synchronization of the maintenance position of tracing paper, and a picture imprint position, orientation plate 220a is prepared inside the imprint drum 218. With rotation of the imprint drum 218, criteria position sensor 220b generates a predetermined reference signal, whenever orientation plate 220a crosses the sensor concerned. Tracing paper is conveyed with the feed roller 213 from the feed cassette group 212 on a conveyance way, and is conveyed by the timing roller 217 with the conveyance roller 214. When tracing paper is inserted from a detachable tray 216, it is conveyed by the timing roller 217 with the conveyance roller 215. The timing roller 217 supplies tracing paper to the imprint drum 218 synchronizing with the above-mentioned reference signal, and holds tracing paper to the position on the imprint drum 218. Electrostatic adsorption of the tracing paper supplied to the imprint drum 218 from the timing roller 217 is carried out by the adsorption charger 219 at the imprint drum 218. The above-mentioned printing process is repeatedly performed about four colors of cyanogen (C), MAZENDA (M), yellow (Y), and black (BK). At this time, the exposure lamp 101 and Mirrors 103a, 103b, and 103c repeat predetermined operation synchronizing with operation of the photo conductor drum 204 and the imprint drum 218. then, tracing paper -- an electric discharge separation charger pair -- it is that the charge of the form which was carrying out electrostatic

adsorption by 221 is removed, and dissociates from the imprint drum 218 the tracing paper separated from the imprint drum 218 -- a fixing roller pair -- after fixing processing is performed by 223, paper is delivered to the delivery tray 224

[0017] Drawing 4 is drawing showing each signal-processing section of the above-mentioned reading signal-processing section 106. Each image data of R, G, and B of the manuscript read by the CCD sensor 105 has dispersion by the individual differences of the CCD sensor 105 with which each copying machine is equipped. For this reason, even when the criteria patch of the same color table is read, it reads for every copying machine and the values of data differ. In the reader color-correction processing section 601, the read RGB image data are amended to the standard RGB image data standardized by NTSC specification, Hi-Vision specification, etc. Each image data of OR, OG, and alumnus to whom amendment was given in the reader color-correction processing section 601 is outputted to the external I/O port 108 while it is outputted to the following color space conversion processing section 602. The peripheral device connected to the copying machine concerned receives the image data of OR, OG, and alumnus of a manuscript through the external I/O port 108. Moreover, in the copying machine of this example, it will also be possible to form a picture using the image data of OR, OG, and alumnus inputted through the peripheral-device shell external I/O port 108, and a copying machine will function as a printer in this case. This is because it is set up so that the RGB image data by which each processing section after the reader color-correction processing section 601 was standardized may be used. The color space conversion processing section 602 changes it into each data of a L*a*b* color coordinate system, after changing the standardized RGB image data (OR, OG, alumnus) into an XYZ color coordinates. Drawing 5 is drawing showing a L*a*b* color-coordinate-system solid. Lightness 0 (black)-255 (white) is expressed with the unit [saturation / L*, a hue, and] a* and b*. Chromaticity component a* and b* express the direction of a color, respectively, and, in chromaticity component a*, red - green direction and chromaticity component b* expresses the direction of yellow - blue. Here, changing RGB image data into a L*a*b* color coordinate system is based on the following reasons. As mentioned above, by the GBTC method, the 8-bit image data Xij within a 4x4-pixel block is changed into every 2-bit code data phiij. In the case of a decryption, 256 gradation data of the gradation width-of-face index LD and four kinds of values specified based on the average information LA are made to correspond to code data phiij to which it was assigned by each pixel, and are replaced. Thus, the image data obtained by decryption has the error of the grade to which the image data before encoding is received. If the color of each pixel is reproduced using each image data of R, G, and B which have these errors, a gap will arise in the color of the edge portion of a manuscript. However, if each data of a L*a*b* color coordinate system is used, even if an error arises in the value of the data decrypted, a gap of a color will not arise into the edge portion of a manuscript only by lightness and a chromaticity changing somewhat. For this reason, in the copying machine of this example, in case the image data of a manuscript is encoded and decrypted, RGB image data are once changed into the data of a L*a*b* color coordinate system. Using the data of a L*a*b* color coordinate system with the copying machine of this example may change into the data of other color coordinate systems, such as a L*u*v* color coordinate system, and YCrCb, HVC, as long as it is based on the reason for the above and changes RGB image data into the data of a hue, lightness, and saturation. In the coding processing and decryption processing by the GBTC method, as shown in previous "-one number" - "a-four number" and "Table 2", division process is used abundantly. For this reason, when the difference of the component data of each pixel is small, the repeatability of the image data which the difference is lost in the middle of an operation, and is obtained by decryption processing falls. Then, in order to reduce degradation of the image data based on the above-mentioned division process, before encoding each data of image information L* of a manuscript expressed with a L*a*b* color coordinate system, a*, and b*, the color space optimization processing section 603 is changed so that it may be applied and distributed over maximum from the minimum value to which each data can take the distribution state of the data of a lightness component and a chromaticity component in a color space based on the minimum value and maximum of each data. In this example, data processing based on the table of drawing 6 (a) - (c) is performed to each data

of a lightness component and a chromaticity component, the distribution of lightness component L* is changed into 0-255 for every manuscript, and it is for every manuscript about the distribution of each component of chromaticity a* and b*. - It changes into 127-128. First, minimum value L*min, a*min, b*min and maximum L*max, a*max, and b*max are calculated about each data of image information L* of a manuscript, a*, and b*. In the color space optimization processing section 603, about lightness component L*, the operation shown in the following "-five number" is performed, and it asks for lightness component L1*.
[Equation 5]
L1*=255/(L*max-L*min) x (L*-L*min)
This data processing is due to the table shown in drawing 6 (a). That is, by the operation of the above "a-five number", the value of lightness component L* distributed in the range of L*min-L*max is changed into the value distributed over all the ranges of 0-255. Moreover, about chromaticity component a*, the operation shown in the following "-six number" is performed, and it asks for chromaticity component a1*.
[Equation 6]
a1*=255/(a*max-a*min) x(a*-a*min)-127 -- the data processing concerned is due to the table shown in drawing 6 (b) Namely, value of chromaticity component a* distributed in the range of a*min-a*max by the operation of the above "a-six number" - It changes into the value distributed over all the ranges of 127-128. Furthermore, about chromaticity component b*, the operation shown in the following "-seven number" is performed, and it asks for chromaticity component b1*.

[Equation 7]
b1*=255/(b*max-b*min) x(b*-b*min)-127 -- the data processing concerned is due to the table shown in drawing 6 (c) Namely, value of chromaticity component b* distributed in the range of b*min-b*max by the operation of the above "a-seven number" - It changes into the value distributed over all the ranges of 127-128. In addition, minimum value L*min of each data of image information L* of the manuscript used by the operation shown in above-mentioned "a-five number" - "a-seven number", a*, and b*, a*min, b*min and maximum L*max, a*max, and b*max are memorized to the hard disk 614, and in case color space inverse transformation processing is performed, they are used, respectively. In coding/decryption processing section 604, after performing coding processing of a GBTC method, the data (the gradation width-of-face index LD, the average information LA, code data phiij) encoded based on the result which distinguished the attribute of a picture and was distinguished in each block unit are compressed again to explain in detail later. Here, the attribute of a picture means five, a monochrome poor picture, a color poor picture, monochrome binary picture, monochrome multiple-value picture, and a full color picture. The compressed data obtained by compression for the second time is stored in the compression image memory 610 with the flags f1, f2, and f3 which show the attribute of the picture. When performing decryption processing, CPU611 reads the flags f1, f2, and f3 which show the attribute of the picture while reading the compressed data corresponding to each address from the compression image memory 610 to coding/decryption processing section 604. In coding/decryption processing section 604, it elongates based on the value of the flags f1, f2, and f3 which show the attribute of a picture to the data (the gradation width-of-face index LD, the average information LA, code data phiij) which had repressed data encoded. Then, the data encoded according to the GBTC method are decrypted, and lightness component L2*, chromaticity component a2*, and b2* of image data are outputted. In the color space reverse optimization processing section 605, maximum L*max, a*max, b*max and minimum value L*min, a*min, and b*min are read from a hard disk 614, and a distribution of each data of L2* and a2* which were decrypted, and b2* is returned to original L*max-L*min, a*max-a*min, and b*max-b*min using the read value. These processings are performed based on the table shown in drawing 7 (a) - (c). That is, about lightness component L2*, data processing of the following "-eight number" is performed, and it returns to lightness component L3* distributed over L*max-L*min.
[Equation 8]
About L3*= (L*max-L*min) / 255xL2*+L*min, and chromaticity component a*, data processing

of the following "-nine number" is performed, and it returns to chromaticity component a3* distributed over a*max-a*min.
[Equation 9]
About a3*= (a*max-a*min) / 255x(a2*+127)+a*min, and chromaticity component b*, data processing of the following "-ten number" is performed, and it returns to chromaticity component b3* distributed over b*max-b*min.
[Equation 10]
In the b3*=(b*max-b*min)/255x(b2*+127)+b*min color space inverse transformation processing section 606, each data of L3* and a3* which were restored, and b3* is transformed inversely to the RGB image data of OR1, OG1, and alumnus1 in the above-mentioned color space reverse optimization processing section 605. Reflection / concentration transform-processing section 607 outputs the concentration data of DR, DG, and DB, after performing predetermined reflection / concentration transform processing to the RGB image data of OR1, OG1, and alumnus1. In the masking processing section 608, after the RGB image data changed into concentration data are changed into the image data of any 1 color of cyanogen (C), a Magenta (M), yellow (Y), and black (BK), they are outputted to the image data amendment section 201. In the image data amendment section 201, after performing predetermined gradation amendment (gamma amendment) processing to the gradation data outputted from the masking processing section 608, the gradation data concerned are outputted to the printer exposure section 202.
[0018] (2-2) Control-panel drawing 8 is the front view of the control panel 300 with which the digital full color copying machine of this example is equipped. The ten key 301 into which a control panel 300 inputs the number of copies, and the start key 302 which starts copy operation, A setup in the mode and the display 303 which displays a copy situation, and the selection key 304 which chooses the mode currently displayed on the display 303, The enter key 305 which sets up the mode currently displayed on the display 303, It has the picture editing key 306 which carries out a selection setup of the picture edit mode, the scale-factor setting key 307 which sets up a copy scale factor, the form selection key 308 which chooses the size of tracing paper, and the auto setting key 309 which sets up an automatic form optional feature. In the copying machine of this example, edit/processing processing to perform can be set up according to the attribute of the picture distinguished per 4x4 pixel block. The content of edit/processing processing becomes settled by setup of the item displayed on a display 303 corresponding to the depression of the picture editing key 306. The selection and a setup of an item which are displayed on a display 303 are performed as follows. First, each item displayed on a display 303 is chosen by the selection key 304, and it is made reversed. Next, a setup of the item which chose the enter key 305 by carrying out a depression is completed. With a setup of the item of edit/processing processing, as shown in the next "table 3", the mode flag MF of the set-up item is set to "1."
[Table 3]

	全体	白黒べた画像	カラーべた画像	白黒2値画像	白黒多値画像	フルカラー画像
モノカラー変換	MF1=1					MF51=1
色変換	MF2=1			MF32=1		MF52=1
イレース	MF3=1	MF13=1	MF23=1	MF33=1	MF43=1	MF53=1
ネガポジ反転	MF4=1	MF14=1	MF24=1	MF34=1	MF44=1	MF54=1
下地カット	MF5=1	MF15=1	MF25=1			
dpi変換	MF6=1				MF46=1	MF56=1
シャープネス	MF7=1			MF37=1	MF47=1	MF57=1
階調カーブ補正	MF8=1				MF48=1	MF58=1
縁取り・中抜き	MF9=1			MF39=1		

For example, the item of a "monochrome color" is reversed by the selection key 304, by carrying out the depression of the enter key 305, monochrome color transform processing is set up and the whole flag MF 1 and the mode flag MF 51 about a full color picture are set to "1." In this case, in edit/processing processing in which it explains later, all of each gradation width-of-face index LD of chromaticity component a* about a full color picture and b*, the average information LA, and

the value of code data are transposed to 0. About monochrome color transform processing, color transform processing, IRESU processing, a negative positive reversal process, ground cut processing, and dpi transform processing, it is carried out using the data (the gradation width-of-face index LD, the average information LA, code data phiij) encoded by the GBTC method. For this reason, memory which edit processing processing takes conventionally can be lessened. In addition, about sharpness processing, gradation curve amendment processing, and burster-trimmer-stacker-feature extraction processing, it carries out, after decrypting RGB image data as usual.

[0019] (3) Explanation (3-1) main routine drawing 9 of an image processing is the main routine of the copy processing which CPU611 of the copying machine of this example performs. First, the main part of a copying machine is initialized (Step S1000). Next, key input processing from a control panel 300 is performed (Step S2000). Next, pretreatment of the warming up of equipment, shading, picture stabilizing treatment, etc., etc. is performed (Step S3000). Then, CPU611 makes the scanner motor 102 drive, and after it standardizes the RGB image data which read the image data of the manuscript laid on the manuscript base 107, and are read and obtained, it changes the standardized RGB image data into the data of a L*a*b* color coordinate system (Step S4000). After performing coding processing using the GBTC method to the image data of a manuscript expressed with a L*a*b* color coordinate system, it once stores in the compression image memory 610 (Step S5000). In the copying machine of this example, based on the encoded data (the gradation width-of-face index LD, the average information LA, code data phiij) which were stored in the compression image memory 610, the attribute of the picture of the 4x4-pixel block with which the encoded data concerned belong is distinguished, and the encoded data are further compressed based on the distinction result concerned (Step S6000). Here, the attribute of a picture means five, a monochrome poor picture, a color poor picture, monochrome binary picture, monochrome multiple-value picture, and a full color picture. The data with which repressing processing was performed are stored in the compression image memory 610 with the flags f1, f2, and f3 showing an attribute. At the following step S7000, the flags f1, f2, and f3 which show the data stored in the compression image memory 610 and its attribute are read, and the repressed data are elongated based on the attribute of the picture distinguished from the value of each flag to the data (the average information LA, the gradation width-of-face index LD, code data phiij) with which origin was encoded. Based on the gradation width-of-face index LD of data and the average information LA which are elongated and acquired and which were encoded, air entrainment which rationalizes the concentration distribution of a picture, and edit/processing processings, such as color conversion and frame edit, are performed. The encoded data (the average information LA, the gradation width-of-face index LD, code data phiij) which performed the air entrainment concerned and edit/processing processing are stored in the compression image memory 610. At the following step S8000, the data encoded from the compression image memory 610 are read, this is decrypted to 256 gradation data about lightness component L*, chromaticity component a*, and b*, and it returns to RGB image data by performing color space inverse transformation processing further. At Step S9000, image formation processing which forms a picture on a form based on the RGB image data obtained by decryption processing is performed. Although it is not related to direct imaging operation of removal of the remains toner of the photo conductor drum 204 after image formation processing and imaging etc., processing required in order to maintain the condition of equipment is performed (Step S9800). Although it finally is not directly related to image formation processing of this example, a temperature control, communications control, etc. of a fixing assembly are performed (Step S9900).

[0020] (3-2) Key input processing drawing 10 is the processing flow chart of key input processing (Step S2000 shown in drawing 9). In a control panel 300, when a key input is made, according to the kind of YES) and inputted key, the following processings are performed at the (step S2001. When the inputted key is the picture editing key 306 (it is YES at Step S2002), the picture Edit menu screen shown in drawing 8 is displayed on a display 303 (Step S2003). Selection of the edit item of 11 displayed is performed by operating a cursor key 304. The inverse video of the selected item is carried out. The item of a "monochrome color" is chosen on the screen shown in drawing

8 . A setup of the selected item is performed by carrying out the depression of the enter key 305. Even if the set-up item is the case where other items are chosen by operation of a cursor key 304, it maintains the state where it was displayed in white. When a setup in the mode is performed by the user (it is YES at Step S2004), flag setting processing is performed (Step S2005). The mode flag MF of the set-up item is set to "1" in flag setting processing. When a setup in the mode is not performed (it is NO at Step S2004) but the item of an end is chosen (it is YES at Step S2006), after returning the screen of a display 303 to an initial screen (Step S2007), a key input is stood by again (Step S2001). Moreover, when the inputted key is the print key 302 (it is YES at Step S2008), the return of the predetermined imaging start processing is performed and (Step S2009) carried out. When the inputted key is not which key of the picture editing key 306 and the print key 302, either (it is NO at Step S2008), other processings are performed (Step S2010) and it stands by that a key input is made again (Step S2001).

[0021] The above "Table 3" shows the kind of flag set to "1" by the above-mentioned flag setting processing (Step S2100) corresponding to the item chosen by the user and the set-up item. The mode flag is altogether set as "0" in initial setting (Step S1000). For example, when the item of "monochrome color conversion" is set up by the user, the whole flag MF 1 meaning the item concerned having been set up and the mode flag MF 51 of a full color picture with which the transform processing concerned is applied are set to "1." Moreover, when the item of "color conversion" is set up, the mode flags MF32 and MF52 about monochrome binary picture to which the whole flag MF 2 meaning the item concerned having been set up and the transform processing concerned are applied, and a full color picture are set to "1." When the item of "IRESU" is set up, the whole flag MF 3 meaning the item concerned having been chosen and the mode flags MF13, MF23, MF33, MF43, and MF53 about the monochrome poor picture to which the processing concerned is applied, a color poor picture, monochrome binary picture, monochrome multiple-value picture, and a full color picture are set to "1." Hereafter, it is as each item also being shown in "Table 3."

[0022] (3-3) Repressing processing drawing 11 is a flow chart about repressing processing of the data encoded by the GBTC method (Step S6000 shown in drawing 9). Here, the attribute of a picture is distinguished from the average information LA on data and the value of the gradation width-of-face index LD by which compression coding was carried out by the GBTC method. Next, repressing processing which cuts down the data which can always be specified based on the attribute of a picture among the lightness component L, chromaticity component a* and b*, and code data phiij is performed. Thereby, it improves, without sacrificing repeatability for the compressibility of image data. Moreover, repeatability is thought as important, and even if it is the case where the number of bits of code data phiij assigned to each pixel is increased, decline in compressibility can be prevented by performing the above-mentioned repressing processing. First, the code data stored in the compression image data memory 610 is read (Step S6001), and attribute distinction processing is performed (Step S6002). In this attribute distinction processing, the 4x4-pixel block about the code data concerned distinguishes whether it belongs to which picture of a monochrome poor picture, a color poor picture, monochrome binary picture, monochrome multiple-value picture, and a full color picture for every code data, and the value of the poor picture flag f1, the color / monochrome flag f2, and the binary / multiple-value flag f3 is set up according to a distinction result, respectively. The value of the set-up each flags f1, f2, and f3 is stored in the compression image memory 610 as attribute information. Then, based on the relation between the attribute of the block concerned, and the attribute of each block in the predetermined range (for example, 7x7 blocks) centering on the block concerned, the result of attribute distinction processing is examined for every block, and macro attribute distinction processing in which the attribute information on the block carried out the misjudgment exception is corrected is performed. The result of the macro attribute distinction processing concerned is memorized in different area from the storage area of the above-mentioned attribute information on the compression image memory 610. About attribute distinction processing (Step S6002), a flow chart is used and explained later. At the following step S6003, the value of each above-mentioned flag is investigated and the following processings are performed according to the kind of each picture.

When a 4x4-pixel block belongs to a monochrome poor picture (flag fl=1, flag f2=1), monochrome poor picture characteristic quantity extraction processing (Step S6004) is performed. Here, the histogram data of the average information LA on lightness component L* are created. Next, monochrome poor picture repressing processing is performed (Step S6005). When a 4x4-pixel block belongs to a color poor picture (flag fl=1, flag f2=0), color poor picture characteristic quantity extraction processing (Step S6006) is performed. Here, each histogram data of each average information LA on lightness component L*, chromaticity component a*, and b* is created. Next, color poor picture repressing processing is performed (Step S6007). When a 4x4-pixel block belongs to monochrome binary picture (flag fl=0, flag f2=1, flag f3=1), monochrome binary picture characteristic quantity extraction processing (Step S6008) is performed. Here, it asks for monochrome ratio of each pixel which exists in a 4x4-pixel block. Next, monochrome binary picture repressing processing is performed (Step S6009).

When a 4x4-pixel block belongs to monochrome multiple-value picture (flag fl=0, flag f2=1, flag f3=0), monochrome multiple-value picture characteristic quantity extraction processing (Step S6010) is performed. Here, the histogram data of the average information LA on lightness component L* and the gradation width-of-face information LD are created. Then, monochrome multiple-value picture repressing processing is performed (Step S6011). When a 4x4-pixel block belongs to a full color picture (flag fl=0, flag f2=0, flag f3=1), full color picture characteristic quantity extraction processing (Step S6012) is performed. Here, each average information LA on lightness component L*, chromaticity component a*, and b* and the histogram data of the gradation width-of-face index LD are formed. The compressed data obtained by repressing processing is stored in the compression image memory 610 after the processing execution according to the kind of picture to which the above 4x4-pixel block belongs (Step S6013). However, the encoded data about a full color picture are stored in the compression sign memory 611 in the state as it is. The above processing (Steps S6001-S6013) is performed to the data with which all 4x4-pixel blocks of a manuscript were encoded. When the above-mentioned processing is performed to the encoded data which are all 4x4-pixel blocks, the return of YES) and the processing is ended and carried out at the (step S6014.

[0023] (3-3-1) Attribute distinction processing drawing 12 is the flow chart of attribute distinction processing (Step S6002 shown in drawing 11). First, it distinguishes whether the 4x4-pixel block corresponding to the encoded data belongs to a poor picture (Step S6020). In poor picture distinction processing, when it is judged that a 4x4-pixel block belongs to a poor picture, the value of a flag fl is set as 1, and when it is judged that it does not belong to a poor picture, the value of a flag fl is set as 0. The value of a flag fl is investigated after the end of poor picture distinction processing (Step S6021). Here, when the value of a flag fl is 1, it judges that the 4x4-pixel block corresponding to code data belongs to a poor picture, and the following processings are performed. First, a color / monochrome distinction processing is performed (Step S6022). In a color / monochrome distinction processing, when judging that a 4x4-pixel block belongs to monochrome picture, the value of a flag f2 is set as 1, and when judging that it belongs to a color picture, the value of a flag f2 is set as 0. The value of a flag f2 is investigated after the end of a color / monochrome picture distinction processing (Step S6023). Here, when the value of a flag f2 is 1, processing which relates the attribute signal showing a monochrome poor picture with the code data concerned, and is written in a hard disk 614 is performed (Step S6024). Moreover, when the value of a flag f2 is 0, processing which relates the attribute signal showing a color poor picture with the code data concerned, and is written in a hard disk 614 is performed (Step S6025). when the value of a flag fl is 0 in the above-mentioned step S6020, it judges that it belongs to the picture in which the 4x4-pixel block had two or more gradation gradation (it is NO at Step S6021), and a picture is which picture of a color/monochrome -- moreover, in the case of monochrome picture, this is a binary picture -- or it investigates whether it is a multiple-value picture First, a color / monochrome distinction processing is performed (Step S6026). In a color / monochrome distinction processing, when judging that a 4x4-pixel block belongs to monochrome picture, the value of a flag f2 is set as 1, and in judging that it belongs to a color picture, it sets the value of a flag f2 as 0. The color / monochrome distinction processing in Step S6026 are completely the same

as the processing in the above-mentioned step S6022. The value of a flag f2 is investigated after the end of a color / monochrome picture distinction processing (Step S6027). when the value of a flag f2 is 1, the monochrome picture concerned is a binary picture succeedingly here -- or distinction processing about being a multiple-value picture is performed (Step S6028) In binary / multiple-value distinction processing, when judging that a 4x4-pixel block belongs to a binary picture, the value of a flag f3 is set as 1, and when judging that it belongs to a multiple-value picture, the value of a flag f3 is set as 0. The value of a flag f3 is investigated after binary / multiple-value distinction processing end (Step S6029). Here, when the value of a flag f3 is 1, processing which relates the attribute signal showing monochrome binary picture with the encoded data concerned, and is written in a hard disk 614 is performed (Step S6030). Moreover, when the value of a flag f3 is 0, processing which relates the attribute signal showing monochrome multiple-value picture with the encoded data concerned, and is written in a hard disk 614 is performed (Step S6031). When the value of the flag f2 set up in the color / monochrome distinction processing in the upper step S6026 is 0, it is judged that it is a full color picture (being Step S6027 NO). Then, the attribute signal showing a full color picture is related with the encoded data concerned, and it writes in a hard disk 614 (Step S6032). After performing the above-mentioned processing about all the encoded data that are stored in the compression image memory 610 (it is YES at Step S6033), macro attribute distinction processing (Step S6034) is performed. In macro attribute distinction, based on the relation between the attribute of the block concerned, and the attribute of each block in the predetermined range (for example, 7x7 blocks) centering on the block concerned, the result of attribute distinction processing is examined for every block, and the attribute information on the block carried out the misjudgment exception is corrected.

[0024] <3-3-1-1> poor picture distinction processing drawing 13 is the flow chart of poor picture distinction processing (Step S6020 shown in drawing 12). A poor picture means the picture which consists of an only color which has certain fixed lightness component L*, chromaticity component a*, and b*. Visually, when the value of each gradation width-of-face index LD of lightness L*, chromaticity a*, and b* is below a predetermined value, it is recognized as it being a poor picture. However, when the value of the average information LA on lightness component L* is to some extent high (240 or more [for example,]), even if the value of the gradation width-of-face index LD of lightness L*, chromaticity a*, and b* is a bigger value than the above-mentioned predetermined value, it is recognized as it being a poor picture. In poor picture distinction processing of this example, the value of the average information LA on lightness component L* is less than 240. When the value of the gradation width-of-face index LD of each component of lightness L*, chromaticity a*, and b* is two or less (it is YES altogether at Steps S6040-S6043), Or the value of the average information LA on lightness component L* is 240 or more (it is NO at Step S6040). When the value of the gradation width-of-face index LD of each component of lightness L*, chromaticity a*, and b* is six or less, it judges that YES) and 4x 4-pixel block belong to a poor picture at the (steps S6046-S6048, and the value of a flag f1 is set as 1 (Step S6044 or S6049). When the value of each gradation width-of-face index LD of lightness component L*, chromaticity component a*, and b* does not fulfill the above-mentioned conditions (the value of the average information LA on lightness component L* is less than 240 (it is YES at Step S6040)) When there is at least one NO among Steps S6041-S6043, or when the value of the average information LA on lightness component L* is 240 or more (it is NO at Step S6040) and there is at least one NO among Steps S6046-S6048 It judges that a 4x4-pixel block does not belong to a poor picture, and the value of a flag f1 is set as 0 (Step S6045 or S6050).

[0025] <3-3-1-2> color / monochrome distinction processing drawing 14 is the flow charts of a color / monochrome distinction processing (Step S shown in drawing 12 6022 and 6026). The contents of processing performed at Step S6026 are the same as the processing performed at Step S6022 so that it may illustrate. Here, the color / monochrome distinction processing in Step S6022 are explained in order. As for monochrome picture, the data value of chromaticity component a* and b* consists of about 0 achromatic color. For example, when the value of the average information LA on chromaticity a* and b* each component is less than **five, it can be judged that it is the picture which consists of an achromatic color. However, only by the above-mentioned

decision criterion, the value of each average information LA on chromaticity component a* and b* is less than **five, the data value of chromaticity component a* of the pixel of others [data value / of chromaticity component a* of a certain pixel] is 125 in -120, and when the average information LA serves as a small value, this will be judged accidentally / be / monochrome picture / it]. Then, only when CPU611 of this example has the value of the gradation width-of-face index LD less than in **five, a 4x4-pixel block judges that it belongs to monochrome picture. Specifically [both], when the value of each average information LA on chromaticity component a* and b* and the gradation width-of-face information LD is less than **five (it is YES at Steps S6051-S6054), the value of a flag f2 is set as 1 (Step S6055). It will distinguish, if at least one NO) and 4x 4-pixel block of (step S6051-6054 belong to a color picture when the value of each average information LA on chromaticity component a* and b* and the gradation width-of-face information LD is [at least one] **five or more, and the value of a flag f2 is set as 0 (Step S6056).

[0026] <3-3-1-3> binary / multiple-value distinction processing drawing 15 is the flow charts of binary / multiple-value distinction processing (Step S6028 shown in drawing 12). The data with which the 4x4 pixel block of binary pictures was encoded have the large value of the gradation width-of-face index LD of lightness component L*, and 10 which expresses halftone data to code data phiij of lightness component L*, or 00 does not exist. On the other hand, 10 showing halftone data or 00 exists in code data phiij of lightness component L* of the 4x4-pixel block belonging to a multiple-value picture. Then, in binary / multiple-value distinction processing, there is a 200 more than value of the gradation width-of-face index LD of lightness component L* (it is YES at Step S6070). When the values of all code data phiij(s) of lightness component L* are not any of 10 and 00, either (it NO(s) at Steps S6071 and S6072) And by S6073, it judges that a 4x4-pixel block belongs to a binary picture only to YES, and the value of a flag f3 is set to it 1 (Step S6074). On the other hand, when the value of the gradation width-of-face index LD of lightness component L* is 200 or less or one, or 10 or 00 is in the value of NO) and code data phiij of lightness component L* at the (step S6070, either of the (steps S6071 and S6072 is also judged that) and 4x 4-pixel block belong to a multiple-value picture in YES, and sets the value of a flag f3 as 0 (Step S6075).

[0027] The <3-3-1-4> macroscopic attribute distinction processing above-mentioned attribute distinction processing distinguishes the picture attribute of each block with a sufficient precision. However, since an attribute is distinguished for every 4x4-pixel block regardless of the surrounding relation between blocks, in some blocks, it may distinguish accidentally [attribute]. For example, when the picture of a manuscript is a photograph of the person who is monochrome multiple-value picture, it is possible about the portion of the hair of hair to carry out to it being a black poor picture a misjudgment exception. Furthermore, the resolution of a picture may fall with the precision of the reader style of the manuscript picture in the picture read station 100. Moreover, in a color picture reader, bleeding of the color which does not exist in the edge portion of a character picture in fact with the chromatic aberration of a lens etc. may arise. That is, the attribute of each block may not be correctly distinguished by the above-mentioned cause, either. Then, with the copying machine of this example, the area of the fixed range centering on the block which should be observed, for example, each attribute distinction result of 7x7 blocks, is investigated, and the attribute distinction result of a block to observe is examined. Drawing 16 is the flow chart of macro attribute distinction processing (Step S6034 shown in drawing 12). First, the attribute information on an attention block (it is the same the following which is each value of the poor picture flag f1, the color / monochrome picture flag f2, and the binary / multiple-value picture flag f3) that macro attribute distinction processing is performed is read from the compression image memory 610 (Step S6200). Similarly, each attribute information on 7x7 blocks centering on the read block is read (Step S6201). Drawing 17 is drawing showing each attribute distinction result of 7x7 blocks centering on an attention block. Here, the range which reads attribute information is not limited to 7x7 pieces. For example, you may make it read each attribute information on 10x10 blocks centering on an attention block. Moreover, you may change the range which performs macro attribute distinction processing according to the attribute of an attention block. For example, when it supposes that each attribute information on 10x10 blocks is read when an attention block belongs to a full color picture and pictures other than a full color

picture belong, it is good also as reading each attribute information on 7x7 blocks. Thereby more suitable macro attribute distinction processing can be performed. Next, counting of the number which each attribute has is carried out more respectively than the attribute information on each block including an attention block (Step S6202). Set to T the number of the blocks within the limits which perform macro attribute distinction processing, and it is set to the within the limits concerned. The number of the blocks which belong the number of the blocks which belong the number of the blocks which belong the number of the blocks belonging to black and white and a color poor picture to B and monochrome binary picture to S and monochrome multiple-value picture to M and a full color picture is set to F. Calculation shown in following "-11 number" - "a-14 number" is performed, and the rate Bp of a poor picture attribute, the rate Sp of monochrome binary picture attribute, monochrome multiple-value picture Mp, and the rate Fp of a full color picture attribute are computed (Step S6203).
[Equation 11] Bp=B/Tx100 -- [Equation 12] Sp=S/(T-B) x100 -- [Equation 13] Mp=M/(T-B) x100 -- [Equation 14] If the case where it is shown in Fp=F/(T-B) x100 drawing 17 is taken for an example, it will be T= 49, B= 5, S= 14, M= 14, and F= 16, and will be set to Bp=10.2, Sp=31.8, Mp=31.8, and Fp=36.4. The attribute of an attention block is judged after calculation of each rate of an attribute (Step S6204). When the attribute of an attention block is a poor picture or a binary picture, **** and binary attribute macroscopic processing are performed (Step S6205). Moreover, when the attribute of an attention block is monochrome multiple-value picture, monochrome multiple-value macroscopic processing is performed (Step S6206). Moreover, the attribute of an attention block performs full color macro processing to a full color image data case (Step S6207). After performing macro processing [which / of Steps S6205, S6206, and S6207] according to the attribute information on an attention block, it is the compression image memory 610 and the attribute information on an attention block is written in different area from the storage area of the distinction result in the above-mentioned attribute distinction processing (Step S6208). A return is carried out after performing the above-mentioned macroscopic attribute distinction processing to the attribute information on all picture blocks in which it is stored by the compression image memory (Step S6209).
[0028] In <3-3-1-4-1> **** and the binary attribute macroscopic processing above-mentioned attribute distinction processing, the block which should belong to monochrome binary picture is not judged accidentally to be a poor picture. On the contrary, if the block belonging to a poor picture belongs to monochrome binary picture, it will not be carried out a misjudgment exception. This is because it performs only to the block distinguished when distinction of monochrome binary picture did not belong to a poor picture. However, the block of a part of monochrome multiple-value picture or full color picture may be carried out a misjudgment exception, when it belongs to a poor picture or monochrome binary picture. This is the case where a manuscript is monochrome or the person photograph of a color, and it is easy to generate it about the black portion of especially the hair of hair. Then, **** and binary attribute macroscopic processing examine whether if the block which should be distinguished if it originally belongs to monochrome multiple-value picture or a full color picture belongs to a poor picture or monochrome binary picture, it is carried out the misjudgment exception based on each value of the rate Mp of monochrome multiple-value picture attribute, and the rate Fp of a full color picture attribute. Drawing 18 is the flow chart of **** and binary attribute macroscopic processing (Step S6205 shown in drawing 16). First, it judges whether the value of the rate Mp of monochrome multiple-value picture attribute is larger than the predetermined threshold TH1 (Step S6210). In this example, a threshold TH1 is set as 70. This threshold TH1 is a value defined by experiment. When the value of the rate Mp of monochrome multiple-value picture attribute is larger than the predetermined threshold TH1, the attribute information on YES) and an attention block is corrected to monochrome multiple-value picture at the (step S6210 (Step S6211). Moreover, when the value of the rate Mp of monochrome multiple-value picture attribute is one or less predetermined threshold TH, it judges whether the value of NO) and the rate Fp of a full color picture attribute is larger than the predetermined threshold TH2 at the (step S6210 (Step S6212). In this example, a threshold TH2 is set as 50. This threshold TH2 is a value defined by experiment.

When the value of the rate Fp of a full color picture attribute is larger than the predetermined threshold TH2 (it is YES at Step S6212), the attribute information on an attention block is corrected to a full color picture (Step S6213). When the value of the rate Fp of a full color picture attribute is two or less predetermined threshold TH (it is NO at Step S6212), it judges that the distinction result in the above-mentioned attribute distinction processing is right, and a return is carried out, with the attribute information on an attention block maintained. As mentioned above, the precision of attribute distinction processing can be improved by examining the result of the attribute distinction processing performed per block based on relation with the attribute distinction result of a circumference block. In addition, in this example, judging is based on the following reasons in the above-mentioned sequence. That is, when it thought that monochrome multiple-value picture was included in a part of full color picture and the attribute of a picture is expressed with a set, a full color picture includes the largest range. For this reason, it thinks that it should judge from the attribute of the picture which can be judged comparatively clearly, and distinguishes in order of monochrome multiple-value picture and a full color picture. Also in the following processings, it is the same.

[0029] In the <3-3-1-4-2> monochrome multiple-value attribute macroscopic processing above-mentioned attribute distinction processing, if the block belonging to monochrome binary picture, a full color picture, or a poor picture belongs to monochrome multiple-value picture, it may be carried out a misjudgment exception. For example, the case where gradation falls [a portion with a character] locally under the influence of the reading precision of a picture can be considered. Since code data phiij assigned to the block containing this pixel does not polarize two times, it is made into monochrome multiple-value picture a misjudgment exception by it. Then, monochrome multiple-value macroscopic processing examines whether if the block which should be distinguished from monochrome binary picture, a full color picture, or a poor picture originally belongs to monochrome multiple-value picture when being distinguished, if an attention block belongs to monochrome multiple-value picture, it is carried out the misjudgment exception in the above-mentioned attribute distinction processing based on each value of the rate Sp of monochrome binary picture attribute, the full color picture attribute Fp, and the rate Bp of a poor picture attribute. Drawing 19 is the flow chart of monochrome multiple-value macroscopic processing (Step S6206 of drawing 16). First, it judges whether the value of the rate Sp of monochrome binary picture attribute is larger than TH3 (Step S6220). In this example, a threshold TH3 is set as 70. This threshold TH3 is a value defined by experiment. When the value of the rate Sp of monochrome binary picture attribute is larger than the predetermined threshold TH3, the attribute information on YES) and an attention block is corrected to monochrome binary picture attribute at the (step S6220 (Step S6221). Moreover, when the value of the rate Sp of monochrome binary picture attribute is three or less predetermined threshold TH, it judges whether the value of NO) and the rate Fp of a full color picture attribute is larger than the predetermined threshold TH4 at the (step S6220 (Step S222). In this example, a threshold TH4 is set as 50. This threshold TH4 is a value defined by experiment. When the value of the rate Fp of a full color picture attribute is bigger than the predetermined threshold TH4 (it is YES at Step S6222), the image information of an attention block is corrected to a full color picture (Step S6223). When the value of the rate Fp of a full color picture attribute is four or less predetermined threshold TH, it judges whether the value of NO) and the rate Bp of a poor picture attribute is larger than the predetermined threshold TH5 at the (step S6222 (Step S6224). In this example, a threshold TH5 is set as 80. This threshold TH5 is a value defined by experiment. When the value of the rate Bp of a poor picture attribute is larger than the predetermined threshold TH5 (it is YES at Step S6224), the attribute information on an attention block is corrected to a poor picture (Step S6225). When the value of the rate Bp of a poor picture attribute is five or less predetermined threshold TH, it judges that the distinction result of attribute distinction processing is right, and a return is carried out, with the attribute information on an attention block maintained. As mentioned above, the precision of attribute distinction processing can be improved by examining the result of the attribute distinction processing performed per block based on relation with the attribute distinction result of a circumference block.

[0030] In the <3-3-1-4-3> full color attribute macroscopic processing above-mentioned attribute distinction processing, if the block belonging to monochrome binary picture, monochrome multiple-value picture, or a poor picture belongs to a full color picture, it may be carried out a misjudgment exception. In the above-mentioned attribute distinction processing, it is judged that the block belonging to neither a poor picture nor monochrome binary picture nor monochrome multiple-value picture belongs to a full color picture. Therefore, if the block which originally belongs to a poor picture, monochrome binary picture, and monochrome multiple-value picture belongs to a full color picture, when it is carried out the misjudgment exception by the influence of the reading precision of a picture, it thinks. Then, full color macro processing examines whether if the block belonging to a poor picture, monochrome binary picture, and monochrome multiple-value picture originally belongs to a full color picture when being distinguished, if an attention block belongs to a full color picture, it is carried out the misjudgment exception in the above-mentioned attribute distinction processing based on each value of the rate Sp of monochrome binary picture attribute, the rate Mp of monochrome multiple-value picture attribute, and the rate Bp of a poor picture attribute. Drawing 20 is the flow chart of full color macro processing (Step S6207 shown in drawing 16). First, it judges whether the value of the rate Sp of monochrome binary picture attribute is larger than the predetermined threshold TH6 (Step S6230). In this example, a threshold TH6 is set as 70. This threshold TH6 is a value defined by experiment. When the value of the rate of monochrome binary picture attribute is larger than the predetermined threshold TH6 (it is YES at Step S6230), the attribute information on an attention block is corrected to monochrome binary picture (Step S6231). Moreover, when the value of the rate Sp of monochrome binary picture attribute is six or less predetermined threshold TH (it is NO at Step S6230), it judges whether the value of the rate Mp of monochrome multiple-value picture attribute is larger than the predetermined threshold TH7 (Step S6232). In this example, a threshold TH7 is set as 70. This threshold TH7 is a value defined by experiment. When the value of the rate Mp of monochrome multiple-value picture attribute is larger than the predetermined threshold TH7 (it is YES at Step S6232), the attribute nature information on an attention block is corrected to monochrome multiple-value picture (Step S6233). Moreover, when the value of the rate Mp of monochrome multiple-value picture attribute is seven or less predetermined threshold TH (it is NO at Step S6232), it judges whether the value of the rate Bp of a poor picture attribute is larger than the predetermined threshold TH8 (Step S6234). In this example, a threshold TH8 is set as 80. This threshold TH8 is a value defined by experiment. When the value of the rate Bp of a poor picture attribute is larger than the predetermined threshold TH8 (it is YES at Step S6234), the attribute information on an attention block is corrected to a poor picture (Step S6235). When the value of the rate Bp of a poor picture attribute is eight or less predetermined threshold TH (it is NO at Step S6234), it judges that the distinction result of attribute distinction processing is right, and a return is carried out, with the attribute information on an attention block maintained. As mentioned above, the precision of attribute distinction processing can be improved by examining the result of the attribute distinction processing performed per block based on relation with the attribute distinction result of a circumference block. [0031] (3-3-2) The average information LA acquired for every block by coding processing of a characteristic quantity extraction processing GBTC method and the gradation width-of-face indices LD are 1/16 of the amount of information of subject-copy image data, and express the central value of gradation width-of-face data as the average information in all image data. For this reason, the almost same information as the case where the characteristic quantity about lightness component L*, chromaticity component a*, and b* of subject-copy image data is actually calculated will be acquired from 1/16 of data. Time to enable this to attain simplification of the arithmetic circuit which characteristic quantity extraction processing takes, and start extraction processing of characteristic quantity can be shortened. In the copying machine of this example, characteristic quantity extraction processing in which it explains below is performed, and the each extracted characteristic quantity is stored in the hard disk 614. Thereby, in case air entrainment explained later and picture edit / processing processing are performed, the characteristic quantity which corresponds from a hard disk is read, and it becomes possible to perform each processing based on the read value. Therefore, before encoding, based on

the image data after being decrypted, capacity of the memory which processing takes can be lessened compared with the case where air entrainment and picture edit / processing processing are performed. Moreover, the time which the processing itself takes can be shortened.
[0032] <3-3-2-1> monochrome poor picture characteristic quantity extraction processing drawing 21 is the flow chart of monochrome poor picture characteristic quantity extraction processing (Step S6004 shown in drawing 11). Here, a return is carried out after creating the histogram data of the average information LA about all blocks of lightness component L* (Step S6300). The histogram data for which it asked here are stored in a hard disk 614, and in case ground cut processing which is one of the edit/processing processings explained later is performed, they are used.
[0033] <3-3-2-2> color poor picture characteristic quantity extraction processing drawing 22 is the flow chart of color poor picture characteristic quantity extraction processing (Step S6006 shown in drawing 11). First, the histogram data of the average information LA about all blocks of lightness component L* are created (Step S6310). Next, the histogram data of the average information LA about all blocks of chromaticity component a* are created (Step S6311). Next, the histogram data of the average information LA about all blocks of chromaticity component b* are created (Step S6312). Each histogram data for which it asked here is stored in a hard disk 614, and in case ground cut processing which is one of the edit/processing processings explained later is performed, it is used.
[0034] <3-3-2-3> monochrome binary picture characteristic quantity extraction processing drawing 23 is the flow chart of monochrome binary picture characteristic quantity extraction processing (Step S6008 shown in drawing 11). Here, it asks for monochrome ratio of each pixel which exists in a 4x4-pixel block. When the value of 1 bit of high orders of the code data of each pixel in a 4x4-pixel block is 1 (it is YES at Step S6320), the pixel concerned is judged to be white and count-up about a white pixel is performed (Step S6321). Moreover, when the value of 1 bit of high orders of code data is 0 (it is NO at Step S6320), the pixel concerned is judged to be black and count-up about a black pixel is performed (Step S6322). case judgment at the above-mentioned step S6120 has the value of 256 gradation data bigger than the value of the average information LA -- code data phiij= -- 11 and 10 assign -- having -- case it is small -- phiij= -- it is based on 00 and 01 being assigned Monochrome ratio is calculated after making a judgment about all the code data within a 4x4-pixel block (it is YES at Step S6323) (Step S6324). Here, called-for monochrome ratio is stored in a hard disk 614.
[0035] <3-3-2-4> monochrome multiple-value picture characteristic quantity extraction processing drawing 24 is the flow chart of monochrome multiple-value picture characteristic quantity extraction processing (Step S6010 shown in drawing 11). First, the histogram data of the average information LA about all blocks of lightness component L* are created (Step S6330). Next, the histogram data of the gradation width-of-face information LD about all blocks of lightness component L* are created (Step S6331). Each histogram data for which it asked here is memorized by the hard disk 614, and is used by the air entrainment explained later.
[0036] <3-3-2-5> full color picture characteristic quantity extraction processing drawing 25 is the flow chart of full color picture characteristic quantity extraction processing (Step S6012 shown in drawing 11). First, the histogram data of the average information LA about all blocks of lightness component L* are formed (Step S6340). Next, the histogram data of the gradation width-of-face index LD about all blocks of lightness component L* are formed (Step S6341). The histogram data of the average information LA about all blocks of chromaticity component a* are formed (Step S6342). The histogram data of the gradation width-of-face index LD about all blocks of chromaticity component a* are formed (Step S6343). The histogram data of the average information LA about all blocks of chromaticity component b* are formed (Step S6344). The histogram data of the gradation width-of-face index LD about all blocks of chromaticity component b* are formed (Step S6345). Each histogram data for which it asked here is memorized by the hard disk 614, and is used by the air entrainment explained later.
[0037] (3-3-3) In the copying machine of a repressing processing this example, cut down the data which can always be specified based on the attribute information distinguished in the above-mentioned attribute distinction processing (Step S6002) among the average information LA about

lightness component L*, chromaticity component a*, and b*, the gradation width-of-face index LD, and code data phiij, and compress much more image data. The data obtained by repressing processing are stored in the compression image memory 610. The repressing processing performed for every attribute below is explained.

[0038] <3-3-3-1> monochrome poor picture repressing processing drawing 26 is the processing flow chart of monochrome poor picture repressing processing (Step S6005 shown in drawing 11). A monochrome poor picture is an achromatic color (both data values of chromaticity component a* and b* are 0) picture which has specific lightness component L*. That is, a monochrome poor picture is reproducible from the value of above-mentioned specific lightness component L*. Since it is a specific value with the value of lightness component L*, all the values of code data phiij assigned to each pixel within a 4x4-pixel block serve as the same sign. Furthermore, the value of the gradation width-of-face index LD is set to 0. Then, the average information LA on lightness component L* is taken out from the compression image memory 610, and this is stored in the compression image memory 610 as repressing data about a monochrome poor picture (Step S6400). Drawing 27 is the conceptual diagram showing the relation between the encoded data and repressing data. The data after repressing are compressed into 1/18 of the data with which it encoded before repressing. Since the compressibility of the encoded data which are obtained by the GBTC method is 3/8, the compressibility of the data after repressing becomes 1/48.

[0039] <3-3-3-2> color poor picture repressing processing drawing 28 is the processing flow chart of color poor picture repressing processing (Step S6007 shown in drawing 11). A color poor picture is a picture of the single color (the data value of chromaticity component a* and b* is fixed) which has specific lightness component L*. That is, a color poor picture is reproducible from each average information LA on chromaticity component a* and b*, and the average information LA on lightness component L*. Then, each average information LA on lightness component L*, chromaticity component a*, and b* is taken out from the compression image memory 610, and this is stored in the compression image memory 610 as repressing data about a color poor picture (Steps S6410, S6411, and S6412). Drawing 29 is the conceptual diagram showing the relation between code data and repressing data. The data after repressing are compressed into one sixth of the data with which it encoded before repressing. Since the compressibility of the encoded data which are obtained by the GBTC method is 3/8, the data after repressing become 1/16.

[0040] <3-3-3-3> monochrome binary picture repressing processing drawing 30 is the flow chart of monochrome binary picture repressing processing (Step S6009). Monochrome binary picture is a picture of the achromatic color (both the data values of chromaticity component a* and b* are 0) which consists of black (lightness component L*0) or white (lightness component L*255). That is, monochrome binary picture is reproducible from code data phiij about lightness component L*. Moreover, code data phiij which is assigned at each pixel in the case of monochrome binary picture consists of only two signs, 11 or 01. Then, from the compression image memory 610, the value of code data phiij about lightness component L* is taken out, and it changes each the code data of each taken-out pixel into 1-bit data phi'ij, and let the changed 1-bit data be repressing data each. The value of 1-bit data phi'ij is set to 0 at the time of 1 and phiij=01 at the time of phiij=11. As a flow of processing, first, 2 bytes of data of the average information LA and the gradation width-of-face information LD are removed from the data which read and read the 1-block 6-byte data of lightness component L* from the compression image memory 610, and it is made only 4 bytes of data in which the code data assigned to each pixel is shown (Step S6420). Next, the data for 2 bits of the head of 4 bytes of data are read, and this data is set to code data phiij (Step S6421). In the case of the binary picture, code data phiij of 11 or 01 is assigned to each pixel. Then, the value of read 2-bit data phiij is investigated (Step S6422). In the case of phiij=01, phi'ij =0 is assigned (Step S6423). Moreover, in the case of phiij=11, phi'ij =1 is assigned (Step S6424). Next, the data for 2 bits of the head of the above-mentioned 4 bytes of data are shifted, and the next data for 2 bits of the data concerned for 2 bits are made into a head (Step S6425). The above-mentioned steps S6221-S6225 are processed about all by 16 pixels. Thereby, repressing data phi'ij is obtained. Repressing data phi'ij is stored in the compression image memory 610. By the shift operation by

Step S6225, when the first 2-bit data become a head again, the return of YES) and the processing is ended and carried out at the (step S6426. Drawing 31 is the conceptual diagram showing the relation between code data and repressing data. the data after repressing -- 1-bit code data phi'ijx -- it consists of =16 bit data by 16 pixels, and is compressed into one ninth of the code data before repressing Since the compressibility of the code data obtained by the GBTC method is 3/8, the compressibility of the data after repressing becomes 1/24.

[0041] <3-3-3-4> monochrome multiple-value picture repressing processing drawing 32 is the flow chart of repressing processing (Step S6011 shown in drawing 11) of monochrome multiple-value picture. By monochrome multiple-value picture, it is an achromatic color (both chromaticity component a* and b* are 0), and is the picture to which lightness component L* changes from 0 in 255. That is, the monochrome multiple-value picture concerned is reproducible only by lightness component L*. Then, all the information on lightness component L* (the average information LA, the gradation width-of-face index LD, code data phiij) is taken out from the compression image memory 610, and it stores in the compression image memory 610 by making this into repressing image data (Step S6430). Drawing 33 is the conceptual diagram showing the relation between code data and repressing data. The data after repressing are compressed into one third of the code data before repressing. Since the compressibility of the code data obtained by the GBTC method is 3/8, the compressibility of the data after repressing is set to one eighth.

[0042] (3-4) The data by which extension processing repressing was carried out from repressing are stored in the compression image memory 610. It reads the attribute information relevant to the data concerned from a hard disk 614 while it reads the repressing data stored in the compression image memory 610, in case CPU611 forms a picture on a form. Extension processing of the repressed data is performed based on the attribute of the repressing data specified from the read attribute information.

[0043] (3-4-1) Extension processing drawing 34 and drawing 35 from repressing are the flow chart of repressing extension processing (Step S7000 shown in drawing 9). First, the attribute flags f1, f2, and f3 about the 4x4-pixel block which it is going to elongate from a hard disk 614 are read (Step S7001). It specifies whether the data about a 4x4-pixel block belong to which picture of a monochrome poor picture, a color poor picture, monochrome binary picture, monochrome multiple-value picture, or a full color picture from the value of the following attribute flags f1, f2, and f3 (Step S7002). When the data about a 4x4-pixel block are data belonging to a monochrome poor picture (poor picture flag f 1= 1, the color / monochrome picture flag f 2= 1), extension processing from monochrome poor picture repressing data is performed, and the data in which the decryption by the GBTC method is possible are created (Step S7003). Then, edit/processing processing based on a setup by the user is performed (Step S7004). The data elongated by the compression image memory 610 are written in after the above-mentioned processing (Step S7015). When the data about a 4x4-pixel block are data belonging to a color poor picture (poor picture flag f 1= 1, the color / monochrome picture flag f 2= 0), extension processing from color poor picture repressing data is performed, and the data in which the decryption by the GBTC method is possible are created (Step S7005). Then, edit/processing processing based on a setup by the user is performed (Step S7006). The data elongated by the compression image memory 610 are written in after the above-mentioned processing (Step S7015). When the data about a 4x4-pixel block are data belonging to monochrome binary picture (poor picture flag f 1= 0, the color / monochrome picture flag f 2= 1, the binary / multiple-value picture flag f 3= 1), extension processing from monochrome binary picture repressing data is performed, and the data in which the decryption by the GBTC method is possible are created (Step S7007). Then, edit/processing processing is performed based on a setup by the user (Step S7008). The data elongated by the compression image memory 610 are written in after the above-mentioned processing (Step S7015). When the data about a 4x4-pixel block are data belonging to monochrome multiple-value picture (poor picture flag f 1= 0, the color / monochrome picture flag f 2= 1, the binary / multiple-value picture flag f 3= 0), extension processing from monochrome multiple-value picture repressing data is performed, and the data in which the decryption by the GBTC method is possible are created (Step S7009). Air entrainment processing corresponding to monochrome multiple-value picture is

performed to the elongated data (Step S7010). Then, edit/processing processing based on a setup by the user is performed (Step S7011). The data elongated by the compression image memory 610 are written in after the above-mentioned processing (Step S7015). When the data about a 4x4-pixel block are data belonging to a full color picture (poor picture flag f 1= 0, the color / monochrome picture flag f 2= 0), extension processing from full color picture repressing data is performed, and the data in which the decryption by the GBTC method is possible are created (Step S7012). Air entrainment corresponding to the full color picture is performed to the elongated data (Step S7013). Then, edit/processing processing based on a setup by the user is performed (Step S7014). The data elongated by the compression image memory 610 are written in after the above-mentioned processing (Step S7015). The above-mentioned processing is repeated and performed until it performs to all the data stored in the compression image memory 610 (Step S7016).

[0044] Extension processing drawing 36 from <3-4-1-1> monochrome poor picture repressing shows the flow chart of the extension processing (Step S7003 shown in drawing 34) from monochrome poor picture repressing. In the case of a monochrome poor picture, the data stored in the compression image memory 610 are only 1-byte (8 bits) data which are the average information LA on lightness component L*, as shown in the upper case of drawing 37 . First, from the compression image memory 610, repressing data are read and let this be Data A (Step S7100). Let Data A be the average information LA on lightness component L* (Step S7101). A monochrome poor picture is a colorless picture. For this reason, all the data of chromaticity component a* and b* are 0. Based on the property of this monochrome poor picture, all of the average information LA on chromaticity component a* and b*, the gradation width-of-face index LD, and the value of code data phiij are set as 0 (Steps S7102 and S7103). The code data obtained by the above-mentioned steps S7100-S7103 is shown in the lower berth of drawing 37 .

[0045] Extension processing drawing 38 from <3-4-1-2> color poor picture repressing is the flow chart of the extension processing (Step S7005 shown in drawing 34) from color poor picture repressing data. In the case of the color poor picture, as shown in the upper case of drawing 39 , each average information LA on lightness component L*, chromaticity component a*, and b* (8 bits) is stored in the compression image memory 610 in order. First, from the compression image memory 610, 1 byte of the head of repressing data is read and let this be Data A (Step S7110). Let Data A be the average information LA on lightness component L* (Step S7111). 0 is assigned to the gradation width-of-face index LD and code data phiij of lightness component L* (Step S7112). Next, 1 byte next to repressing data is read, and let this be Data B (Step S7113). Let Data B be the average information LA on chromaticity component a* (Step S7114). 0 is assigned to the gradation width-of-face index LD and code data phiij of chromaticity component a* (Step S7115). Next, 1 byte of the last of repressing data is read and let this be Data C (Step S7116). Let Data C be the average information LA on chromaticity component b* (Step S7117). 0 is assigned to all gradation width-of-face index LD and code data phiij(s) of chromaticity component b* (Step S7118). The code data obtained by the above-mentioned steps S7110-S7118 is shown in the lower berth of drawing 39 .

[0046] Extension processing drawing 40 from <3-4-1-3> monochrome binary picture repressing is the flow chart of the extension processing (Step S7007 shown in drawing 34) from monochrome binary picture repressing data. As for monochrome binary picture, lightness component L* consists of colorless pixels of 255 or 0. Since the color of each pixel is monochrome binary, both chromaticity component a* and b* are 0. Repressing data phi'ij shown in the upper case of drawing 41 is 2 bytes of data about lightness component L*, and the 1-bit data which constitute the data concerned show each that the color of each pixel in a 4x4-pixel block is white (lightness component L*255) or black (lightness component L*0). Extension to code data from this repressing data is performed by the following procedures. First, 1 byte of data in which "127" is shown in decimal digits are given to the average information LA on lightness component L* (Step S7120). 1 byte of data in which "255" is shown in decimal digits are given to the gradation width-of-face information LD on lightness component L* (Step S7121). 2 bytes of data stored in the compression image memory 610 are read, and let the read data be Data A (Step S7122). Next, the 1-bit data of the head of Data A are read, and let this be Data B (Step S7123). The value of Data B

is investigated (Step S7124). When the value of Data B is 0, phiij of corresponding lightness component L* is set as 01 (Step S7125). Moreover, when the value of Data B is 1, corresponding phiij is set as 11 (Step S7126). The 1-bit data of the head of Data A are shifted to termination, and the following 1-bit data are made into a head (Step S7127). processing of the above-mentioned steps S7123-S7127 -- 16 times -- that is, 2 bytes is performed to all data (Step S7128) Since the pixel in the block concerned is colorless, all of the average information LA, the gradation width-of-face index LD, and code data of chromaticity component a* and b* are set as 0 (Steps S7129 and S7130). The lower berth of drawing 41 shows the code data which elongates the repressing data stored in the above-mentioned compression image memory 610, and is obtained.
[0047] Extension processing drawing 42 from <3-4-1-4> monochrome multiple-value picture repressing is the flow chart of the extension processing (Step S7009 shown in drawing 35) from monochrome multiple-value picture repressing data. Monochrome multiple-value picture is constituted by the colorless pixel. The repressing data of monochrome multiple-value picture consist of a total of 6 bytes of data, as shown in the upper case of drawing 43 . Specifically, it consists of the average information LA (1 byte), the gradation width-of-face index LD (1 byte), and code data phiij (4 bytes) of lightness component L*. First, from the compression image memory 610, the data for 1 byte are read and let this be Data A (Step S7140). Let Data A be the average information LA on lightness component L* (Step S7141). From the compression image memory 610, 1 byte of following data are read and let this be Data B (Step S7142). Let Data B be the gradation width-of-face information LD on lightness component L* (Step S7143). From the compression image memory 610, 4 bytes of remaining data are read and let this be Data C (Step S7144). Data C are set to code data phiij of lightness component L* (Step S7145). Since each pixel of monochrome multiple-value picture is colorless, all of the average data LA (1 byte), the gradation width-of-face index LD (1 byte), and code data phiij (4 bytes) of chromaticity component a* and b* are set as 0 (Steps S7146 and S7147). The drawing 43 lower berth shows the code data which elongates the repressing data stored in the compression image memory 610, and is obtained.
[0048] When the data about the 4x4 pixel block of extension processings from <3-4-1-5> full color picture repressing are data belonging to a full color picture (poor picture flag f 1= 0, the color / monochrome picture flag f 2= 0), 6 bytes each of data of lightness component L*, chromaticity component a*, and b* are stored in the compression image memory 610 as it is. For this reason, by the full color picture, it reads from the compression image memory 610 in order, using 1 byte, 1 byte, and 4 bytes of data [a total of 6 bytes of] as 1 set, 1 byte of data of the beginning of the 1st set are made into the average information LA on lightness component L*, 1 byte of following data are made into the gradation width-of-face index LD of lightness component L*, and it is referred to as code data phiij to which 4 bytes of following data be assigned by each Moreover, 1 byte of data of the beginning of the 2nd set are made into the average information LA on chromaticity component a*, 1 byte of following data are made into the gradation width-of-face index LD of chromaticity component a*, and it is referred to as code data phiij to which 4 bytes of following data were assigned by each pixel. Moreover, 1 byte of data read to the beginning of the 3rd set are made into the average information LA on chromaticity component b*, 1 byte of following data are made into the gradation width-of-face index LD of chromaticity component b*, and it is referred to as code data phiij to which 4 bytes of following data were assigned by each pixel.
[0049] (3-4-2) Air entrainment <3-4-2-1> monochrome multiple-value picture air entrainment drawing 44 is the processing flow chart of the air entrainment (Step S7010) about monochrome multiple-value picture. Here, based on the histogram of the average information LA on the lightness component of all pixel blocks of a manuscript, the value of the average information LA on each block is changed into a proper value, and the concentration distribution of a picture is rationalized. First, from a hard disk 614, the histogram data of the average information LA on lightness component L* are read, and the minimum value Min, Maximum Max, and Average Ave of monochrome multiple-value picture portion are calculated from the read data (Step S7200). Here, the above-mentioned minimum value Min accumulates frequency in order [side / high

concentration], and is taken as a concentration value when the accumulation value exceeds 2% of all frequencies. The above-mentioned maximum Max accumulates frequency in order [side / high concentration], and is taken as a concentration value when the accumulation value exceeds 98% of all frequencies. This removes irregular data. The above-mentioned average Ave should divide the total value of the value which multiplied the frequency by all frequencies in each concentration value. Next, the following air entrainments are performed using the above-mentioned minimum value Min, Maximum Max, and Average Ave (Step S7201). Air entrainment is performed based on the graph shown in drawing 45 , and it changes the value of the average information LA distributed over the range of the minimum value Min - Maximum Max so that it may be distributed over the range of 0-255. Specifically, data processing shown in the following "-15 number" is performed to the average information LA. Average information LA' obtained according to an operation is replaced with the value of the average information LA on original.
[Equation 15]
LA'=255/(Max-Min) x (LA-Min)
Moreover, the graph of drawing 46 indicates the relation between the average information LA at the time of performing another air entrainment, and average information LA" after air entrainment to be the above. the air entrainment based on the graph shown in drawing 46 -- the value of the minimum value Min -- 0 -- the value of Average Ave -- 128 -- the value of Maximum Max -- 255 -- an amendment Specifically, data processing shown in the following "-16 number" is performed to the average information LA. Average information LA" obtained as a result of an operation is replaced with the value of the average information LA on original.
[Equation 16]
LA"=128/(Ave-Min) x (LA-Min)
however, Min<=LA<=Ave LA" -- =127/(Max-Ave) x(LA-Ave)+128, however Ave<=LA<=Max -- according to the air entrainment concerned, compared with the air entrainment performed based on the graph shown in drawing 45 , the repeatability of halftone can be improved more Drawing 47 (a) - (d) is drawing showing the result of the air entrainment performed based on the graph shown in drawing 45 . Drawing 47 (a) shows the subject-copy image before air entrainment. Drawing 47 (b) shows the histogram data of the average information LA on lightness component L* of the above-mentioned subject-copy image. Air entrainment amends that the picture concentration of a subject-copy image inclines toward a low concentration side on the whole. Drawing 47 (c) shows the picture after the air entrainment based on the graph shown in drawing 45 . Drawing 47 (d) shows the histogram data after air entrainment. Comparison of drawing 47 (a) and (c) understands that the bias of a distribution of data is amended.
[0050] <3-4-2-2> full color picture air entrainment drawing 48 shows the flow chart of full color picture air entrainment (Step S7013 shown in drawing 35). Here, based on the histogram of the average information LA on the lightness component of all pixel blocks of a manuscript, and a chromaticity component, the value of the average information LA on each block is changed into a proper value, and the concentration distribution of a picture is rationalized. First, the histogram data of the average information LA on lightness component L* are read from a hard disk 614, and the minimum value Min, Maximum Max, and Average Ave of a full color picture are calculated from the read histogram data (Step S7210). Similarly, from a hard disk 614, the histogram data of the average information LA on lightness component a* and b* are read, and the minimum value Min, Maximum Max, and Average Ave of a full color picture are calculated from the read histogram data (Steps S7211 and S7212). Air entrainment based on a graph is performed to drawing 45 or drawing 46 , and the value of the average information LA on lightness component L* is rewritten (Step S7213). Similarly, the value of the average information LA on chromaticity component a* and b* is rewritten (Steps S7214 and S7215).
[0051] <3-4-3> picture edit / processing processing drawing 49 - drawing 53 show the flow chart of edit/processing processing in the attribute of each picture. Here, edit/processing processing is performed by changing beforehand the average information LA for every block, the gradation width-of-face index LD, and the value of code data phiij into a constant value. The contents of edit/processing processing are set up by the aforementioned key input processing (Step S2000

shown in drawing 9). The following processings are performed when the value of the mode flag MF about edit/processing processing set up about each picture attribute is "1."

(a) This monochrome color transform-processing this processing has changed the picture into the monochrome picture for a full color picture. Although it realizes by transposing the value of chromaticity component a* and b* to 0 in order to change a full color picture into a monochrome picture, if the data encoded by the GBTC method are used, both the average information LA on chromaticity component a* and b* and the value of the gradation width-of-face index LD are realizable only by changing into 0. Thereby, only the 4x4-pixel block distinguished as it is a full color picture in attribute distinction processing can be changed into a monochrome picture, without losing the color information about other 4x4-pixel blocks. Moreover, since the encoded data are used, compared with the case where it performs using 256 gradation data, the amount of memory which conversion takes can be decreased sharply.

(b) This color transform-processing this processing is aimed at a monochrome binary picture like a character picture, and a full color picture. Color transform processing in monochrome binary picture means changing a black character portion and a white ground into predetermined lightness and a predetermined chromaticity. In order to change the black portion and white portion of monochrome binary picture into predetermined lightness and a predetermined chromaticity, it realizes by changing each average information LA on lightness component L*, chromaticity component a*, and b*, and the gradation width-of-face information LD. Thereby, color conversion of only a character picture portion can be carried out, without changing the sexual desire news about other 4x4-pixel blocks. Color conversion is realized by processing with the same said of the case of a full color picture.

(c) About the four xeach 4-pixel block of an attribute chosen for all pictures, this IRESU processing this processing rewrites both the values of the average information LA on the lightness component L*, chromaticity component a*, and b*, and the gradation width-of-face information LD to 0, and changes them into white data. Moreover, it is also possible to perform trimming operation by changing the data of a four xeach 4-pixel block of attributes other than the selected attribute into white data by setup.

(d) This dpi transform-processing this processing is thinning out and memorizing code data phiij for 4x4 pixels to data (2x2 pixels and 1x1 pixel) for monochrome multiple-value picture and a full color picture, and lessens the amount of data which makes picture resolution low and deals with it.

(e) Change this negative positive reversal-process this processing into the value which deducted from 256 the value of lightness component L* of the 4x4-pixel block which corresponds for monochrome multiple-value picture and a full color picture, and it reverses the sign of the value of chromaticity component a* and b* further. Thereby, the negative positive reversal process of a multiple-value gradation picture is realized.

(f) This ground cut processing this processing is rewriting the average information LA on lightness component L* of the 4x4-pixel block which corresponds for a monochrome poor picture and a color poor picture, and changes ground level. Under the present circumstances, the histogram data about lightness component L* for which it asked by characteristic quantity extraction processing (Steps S6090 and S6100) are used.

[0052] <3-4-3-1> monochrome poor picture edit / processing processing drawing 49 is the flow chart of monochrome poor picture edit / processing processing (Step S7004 shown in drawing 34). In a monochrome poor picture, when the value of the mode flag MF 13 is set as "1", YES) and IRESU processing (Step S7301) are performed at the (step S7300. Moreover, when the value of the mode flag MF 14 is set as "1", YES) and a negative positive reversal process (Step S7303) are performed at the (step S7302. When the value of the mode flag MF 15 is set as "1", YES) and ground cut processing (Step S7305) are performed at the (step S304.

[0053] <3-4-3-2> color poor picture edit / processing processing drawing 50 is the flow chart of color poor picture edit / processing processing (Step S7006 shown in drawing 34). In a color poor picture, when the value of the mode flag MF 23 is set as "1", YES) and IRESU processing (Step S7311) are performed at the (step S7310. When the value of the mode flag MF 24 is set as "1",

YES) and a negative positive reversal process (Step S7313) are performed at the (step S7312. When the value of the mode flag MF 25 is set as "1", YES) and ground cut processing (Step S7315) are performed at the (step S7314.
[0054] <3-4-3-3> monochrome binary picture edit / processing processing drawing 51 is the flow chart of monochrome binary picture edit / processing processing (Step S7008 shown in drawing 34). In monochrome binary picture, when the value of the mode flag MF 32 is set as "1", YES) and color transform processing (Step S7321) are performed at the (step S7320. When the value of the mode flag MF 33 is set as "1", YES) and IRESU processing (Step S7323) are performed at the (step S7322. When the value of the mode flag MF 34 is set as "1", YES) and a negative positive reversal process (Step S7325) are performed at the (step S7324.
[0055] <3-4-3-4> monochrome multiple-value picture edit / processing processing drawing 52 is the flow chart of monochrome multiple-value picture edit / processing processing (Step S7011 shown in drawing 35). In monochrome multiple-value picture, when the value of the mode flag MF 43 is set as "1", YES) and IRESU processing (Step S7331) are performed at the (step S7330. When the value of the mode flag MF 44 is set as "1", YES) and a negative positive reversal process (Step S7333) are performed at the (step S7332. When the value of the mode flag MF 46 is set as "1", YES) and dpi transform processing (Step S7335) are performed at the (step S7334.
[0056] <3-4-3-5> full color picture edit / processing processing drawing 53 is a flow chart about full color picture edit / processing processing (Step S7014 shown in drawing 35). In a full color picture, when the value of the mode flag MF 51 is set as "1", YES) and monochrome color transform processing (Step S7341) are performed at the (step S7340. When the value of the mode flag MF 52 is set as "1", YES) and color transform processing (Step S7343) are performed at the (step S7342. When the value of the mode flag MF 53 is set as "1", YES) and IRESU processing (Step S7345) are performed at the (step S7344. When the value of the mode flag MF 54 is set as "1", YES) and a negative positive reversal process (Step S7347) are performed at the (step S7346. When the value of the mode flag MF 56 is set as "1", YES) and dpi transform processing (Step S7349) are performed at the (step S7348.
[0057] In addition, although the average information LA and the value of the gradation width-of-face index LD are beforehand changed into a constant value in the above-mentioned edit/processing processing according to the set-up contents of edit/processing based on an attribute distinction result, this invention is good also as not being limited to this but changing the value of the decrypted data into a constant value beforehand.
[0058]
[Effect of the Invention] In the 1st image processing system of this invention, an attribute distinction means distinguishes the attribute of a picture per block. A macro attribute distinction means corrects the distinction result of the block concerned based on the distinction result by the above-mentioned attribute distinction means of the block of 1, and the block which is within the limits of predetermined [centering on the block concerned]. Thereby, the attribute of the picture for every block can be distinguished correctly. Moreover, an attribute distinction means distinguishes the attribute of the picture to which the block concerned belongs based on the average information on the chromaticity component of the lightness component of a block that coding processing was performed by the coding processing section, a gradation width-of-face index, and the value of code data. For this reason, capacity of memory can be lessened while being able to shorten the time which attribute distinction processing takes compared with the case where attribute distinction of a picture is performed using all the image data read by the reading means. Moreover, with the 2nd image processing system, by carrying out compression coding of the encoded data further based on a distinction result, the compressibility of image data can be improved and the memory taken to store code data can be decreased. Moreover, in the image processing system of one of the above, the concentration distribution of the picture by which ** is also reproduced not using the data before coding by changing the value of the average information on the lightness component of each block or a lightness component, and a chromaticity component into a proper value according to a distinction result can be rationalized based on the histogram of the average information on all blocks. Thereby, saving of memory required for the processing

concerned and shortening of the processing time can be aimed at. Moreover, based on a distinction result, ** can also perform edit/processing of a picture not using the data before coding by changing beforehand average information, a gradation width-of-face index, and the value of code data phiij into a constant value. Thereby, saving of memory required for the processing concerned and shortening of the processing time can be aimed at.

[Translation done.]

* NOTICES *

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is drawing for explaining the flow of coding processing of a general GBTC method.

[Drawing 2] It is drawing showing coding processing and decryption processing of a GBTC method.
[Drawing 3] It is the composition cross section of the digital color copying machine of this example.
[Drawing 4] It is drawing showing each signal-processing section of the reading signal-processing section 106.
[Drawing 5] It is drawing showing a L*a*b* color-coordinate-system solid.
[Drawing 6] (a) changes the distribution of lightness component L* into 0-255 for every manuscript, and (b) and (c) are for every manuscript about the distribution of each component of chromaticity a* and b*. - It is the table used in case it changes into 127-128.
[Drawing 7] (a) - (c) is a table used in case a distribution of each data of L2* and a2* which were decrypted, and b2* is returned to original L*max-L*min, a*max-a*min, and b*max-b*min.
[Drawing 8] It is the front view of a control panel 300.
[Drawing 9] It is drawing showing the main routine of the copy processing which CPU611 of a copying machine performs.
[Drawing 10] It is the processing flow chart of key input processing (Step S2000).
[Drawing 11] It is a flow chart about repressing processing (Step S6000) of the data encoded by the GBTC method.
[Drawing 12] It is the flow chart of attribute distinction processing (Step S6002).
[Drawing 13] It is the flow chart of poor picture distinction processing (Step S6020).
[Drawing 14] It is the flow chart of a color / monochrome distinction processing (Steps S6022 and S6036).
[Drawing 15] It is the flow chart of binary / multiple-value distinction processing (Step S6028).
[Drawing 16] It is the flow chart of macro attribute distinction processing (Step S6034).
[Drawing 17] It is drawing showing each attribute distinction result of 7x7 blocks centering on a certain block.
[Drawing 18] It is the flow chart of **** and binary attribute macroscopic distinction processing (Step S6205).
[Drawing 19] It is the flow chart of monochrome multiple-value picture attribute macroscopic distinction processing (Step S6206).
[Drawing 20] It is the flow chart of full color attribute distinction macroscopic processing (Step S6207).
[Drawing 21] It is the flow chart of monochrome poor picture characteristic quantity extraction processing (Step S6004).
[Drawing 22] It is the flow chart of a color poor picture characteristic quantity extraction warp (Step S6006).
[Drawing 23] It is the flow chart of monochrome binary picture characteristic quantity extraction processing (Step S6008).
[Drawing 24] It is the flow chart of monochrome multiple-value picture characteristic quantity

extraction processing (Step S6010).
[Drawing 25] It is the flow chart of full color picture ****** extraction processing (Step S6012).
[Drawing 26] It is the processing flow chart of monochrome poor picture repressing processing (Step S6005).
[Drawing 27] It is the conceptual diagram showing the relation between the encoded data and the repressing data formed of monochrome poor picture repressing processing.
[Drawing 28] It is the processing flow chart of color poor picture repressing processing (Step S6007).
[Drawing 29] It is the conceptual diagram showing the relation between code data and the repressing data formed of color poor picture repressing processing.
[Drawing 30] It is the flow chart of monochrome binary picture repressing processing (Step S6009).
[Drawing 31] It is the conceptual diagram showing the relation between code data and the repressing data formed of monochrome binary picture repressing processing.
[Drawing 32] It is the flow chart of repressing processing (Step S6011) of monochrome multiple-value picture.
[Drawing 33] It is the conceptual diagram showing the relation between code data and the repressing data formed of repressing processing of monochrome multiple-value picture.
[Drawing 34] It is the flow chart of repressing extension processing (Step S7000).
[Drawing 35] It is the flow chart of repressing extension processing (Step S7000).
[Drawing 36] It is the flow chart of the extension processing (Step S7003) from monochrome poor picture repressing.
[Drawing 37] It is drawing in which showing repressing data in an upper case and showing the code data which elongates repressing data in the lower berth and is obtained.
[Drawing 38] It is the flow chart of the extension processing (Step S7005) from color poor picture repressing data.
[Drawing 39] It is the code data which shows repressing data, elongates repressing data on the upper case and is obtained by the lower berth on it.
[Drawing 40] It is the flow chart of the extension processing (Step S7007) from monochrome binary picture repressing data.
[Drawing 41] It is the code data which shows repressing data, elongates repressing data on the upper case and is obtained by the lower berth on it.
[Drawing 42] It is the flow chart of the extension processing (Step S7009) from monochrome multiple-value picture repressing data.
[Drawing 43] It is the code data which shows repressing data, elongates repressing data on the upper case and is obtained by the lower berth on it.
[Drawing 44] It is the processing flow chart of AE / color tone ready processing about monochrome multiple-value picture (Step S7010).
[Drawing 45] It is an amendment table in 255 about the value of Maximum Max in the value of the minimum value Min 0.
[Drawing 46] It is [value / of the minimum value Min / 0] an amendment table about the value of Maximum Max in 128 in the value of Average Ave 255.
[Drawing 47] (b) shows the histogram data of the average information LA on lightness component L* of the picture of (a), (a) shows the picture (halftone picture) of the manuscript before air entrainment, and (d) is [(c) shows the picture (halftone picture) of the manuscript after air entrainment, and] drawing showing the histogram data of the average information LA on lightness component L* of the picture of (c).
[Drawing 48] It is the flow chart of full color picture AE / color tone ready processing (Step S7013).
[Drawing 49] It is the flow chart of edit/processing processing (Step S7004) in a monochrome poor picture.
[Drawing 50] It is the flow chart of edit/processing processing (Step S7006) in a color poor picture.

[Drawing 51] It is the flow chart of edit/processing processing (Step S7008) in monochrome binary picture.
[Drawing 52] It is the flow chart of edit/processing processing (Step S7011) in monochrome multiple-value picture.
[Drawing 53] It is the flow chart of edit/processing processing (Step S7014) in a full color picture.
[Description of Notations]
106 -- Reading signal-processing section
300 -- Control panel
601 -- Reader color-correction processing section
602 -- Color space conversion processing section
603 -- Color space optimization processing section
604 -- Coding/decryption processing section
605 -- Color space reverse optimization processing section
606 -- Color space inverse transformation processing section
607 -- Reflection / concentration transform-processing section
608 -- Masking processing section
610 -- Compression image memory
611 -- CPU
614 -- Hard disk

[Translation done.]

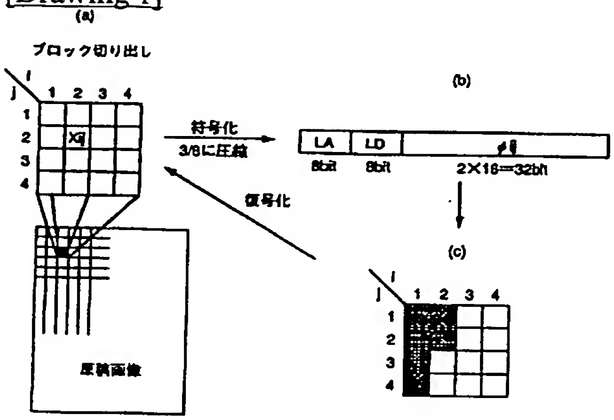
* NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



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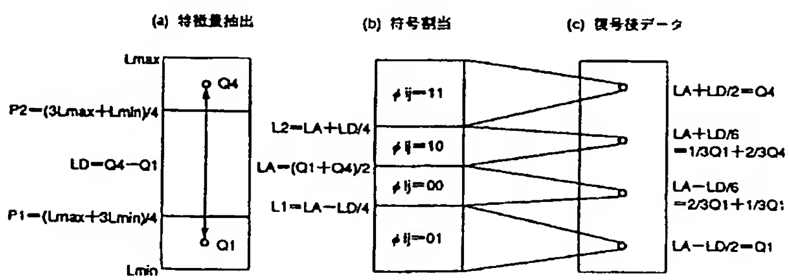

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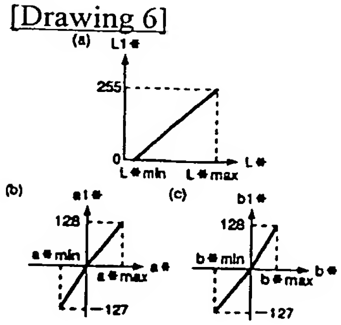

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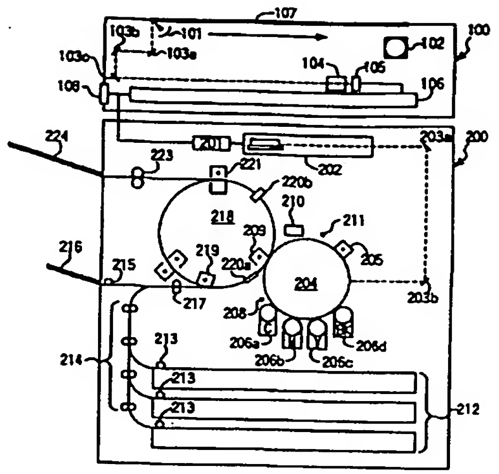

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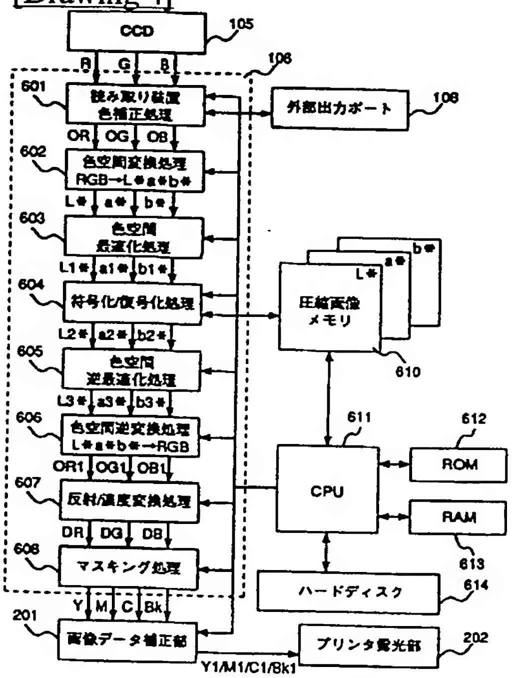

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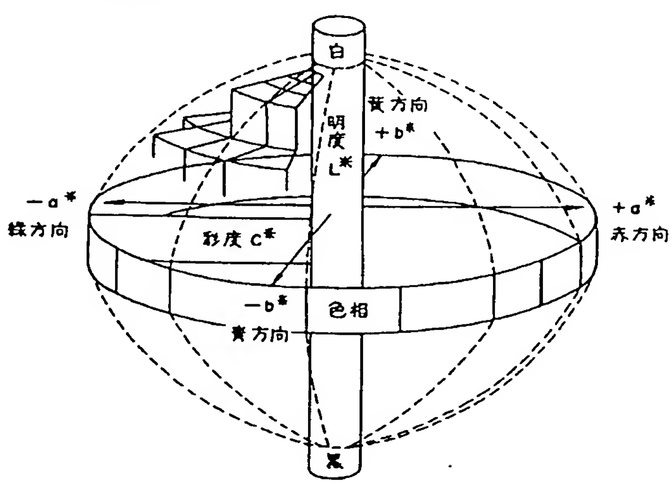

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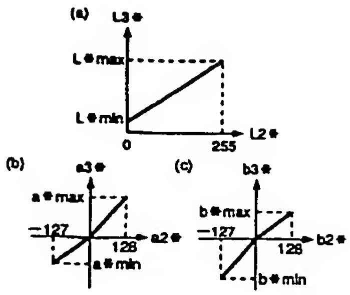

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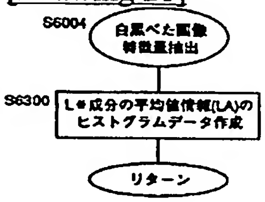

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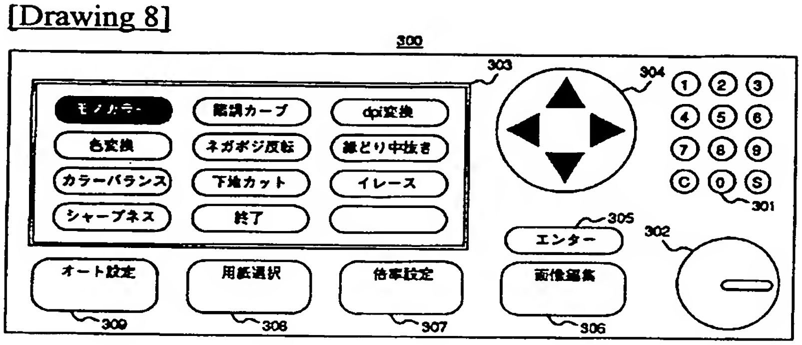

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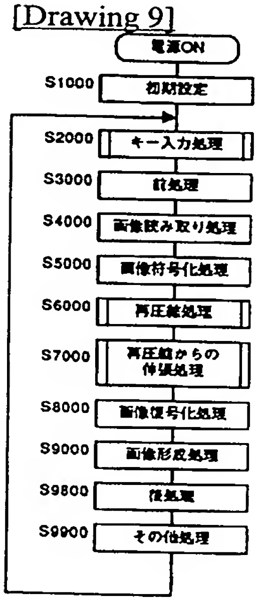

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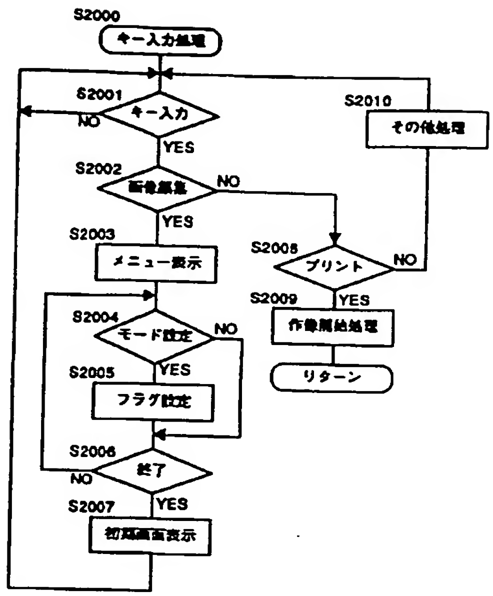

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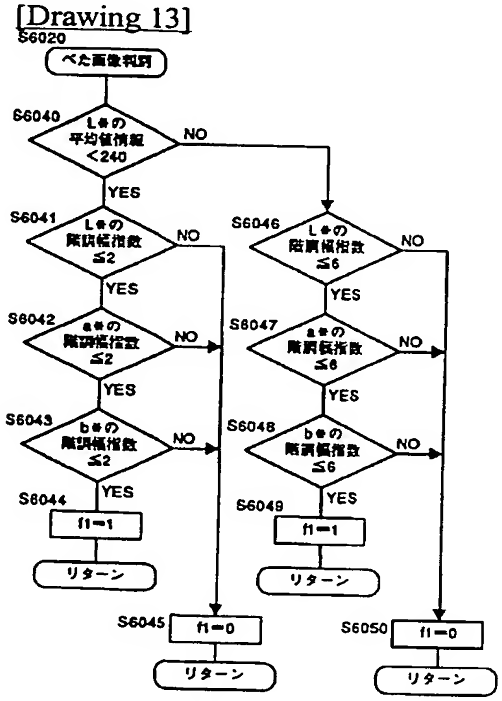

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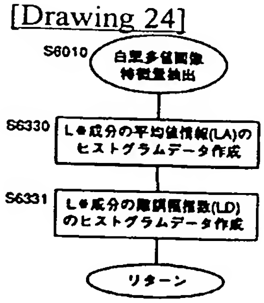

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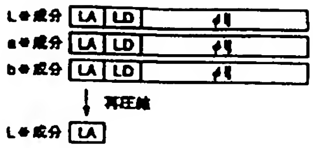

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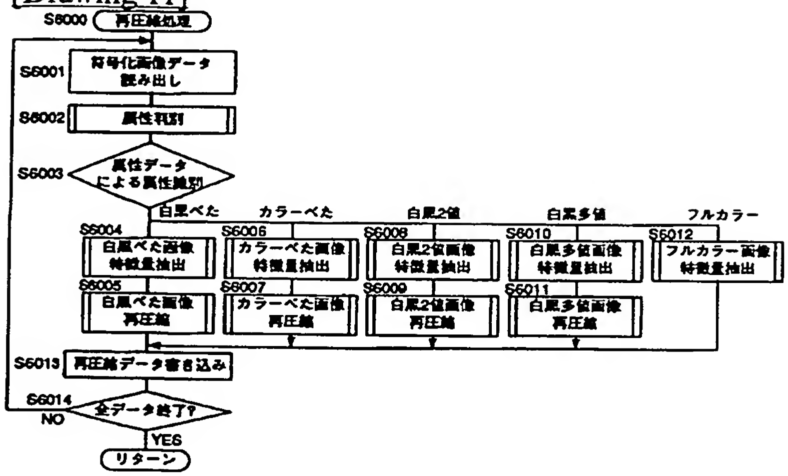

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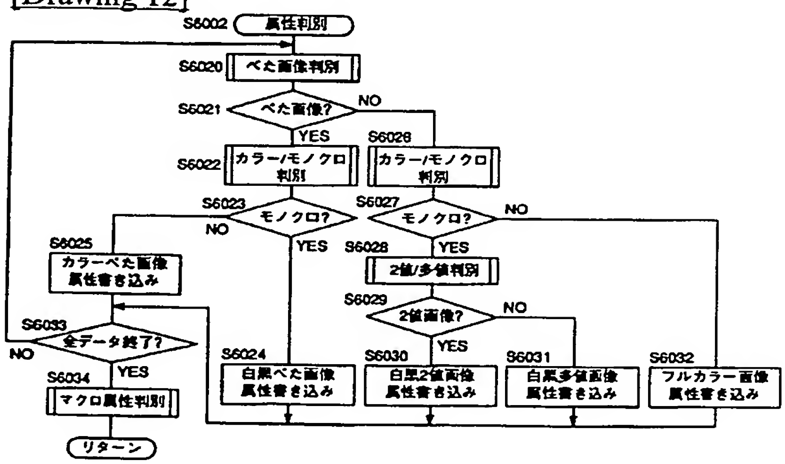

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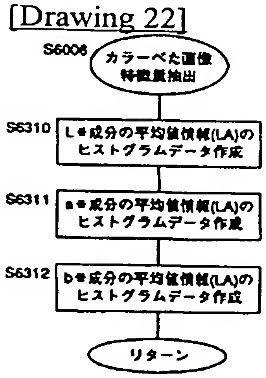

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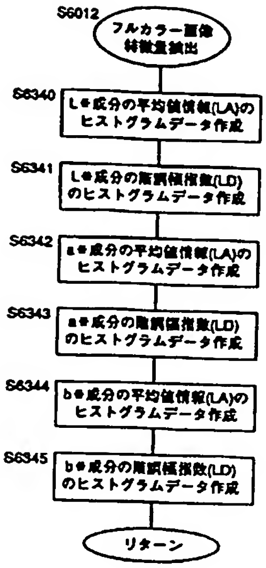

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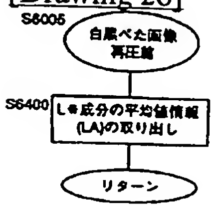

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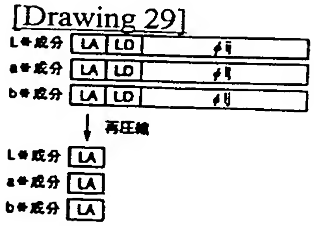

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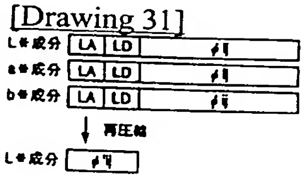

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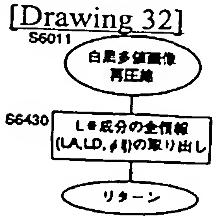

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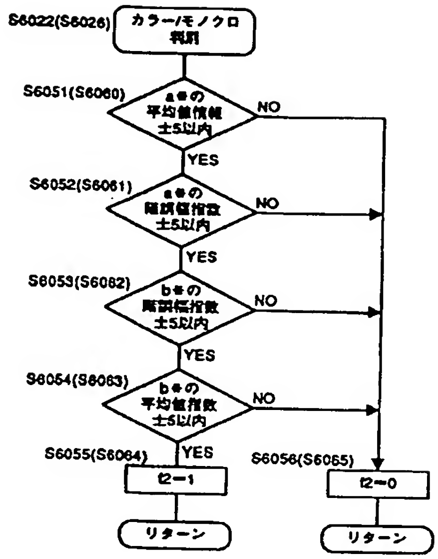

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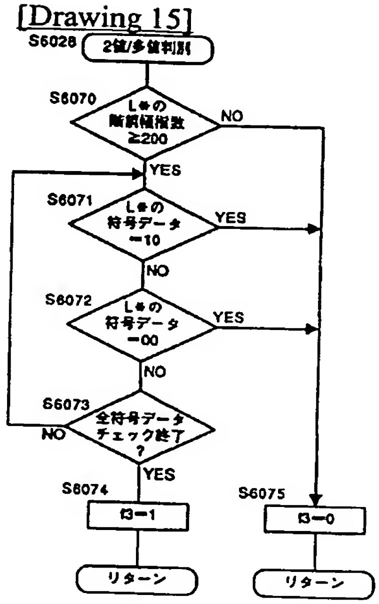

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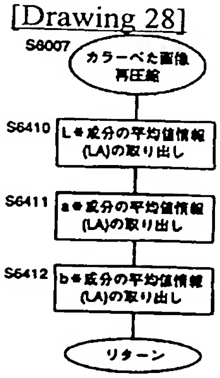

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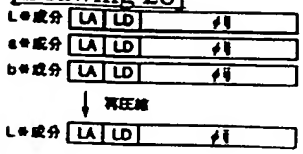

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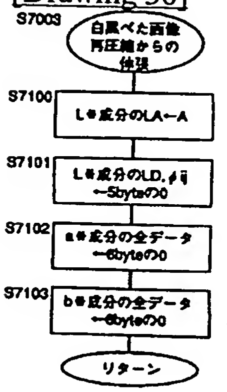

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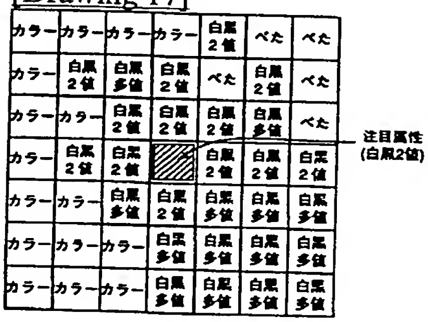

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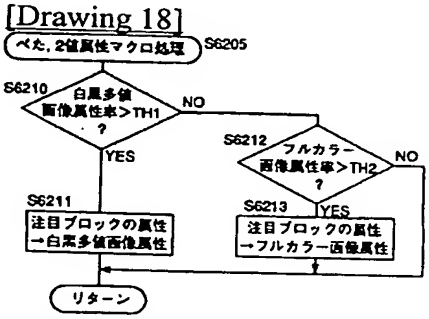

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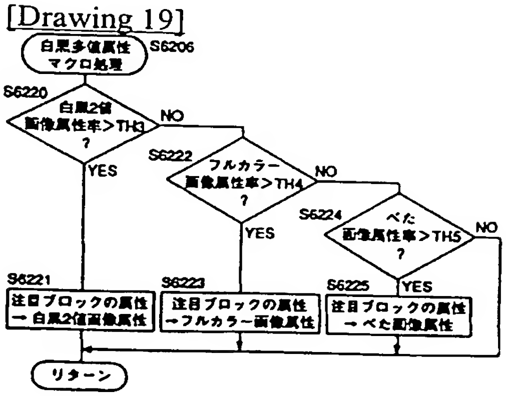

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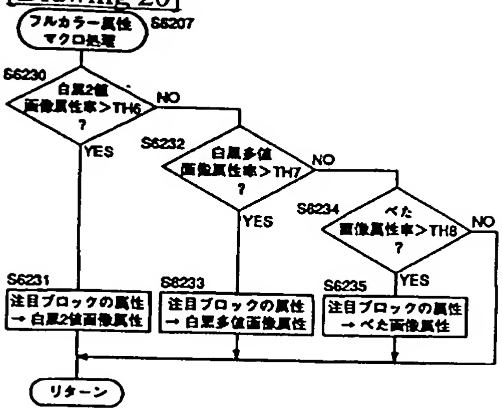

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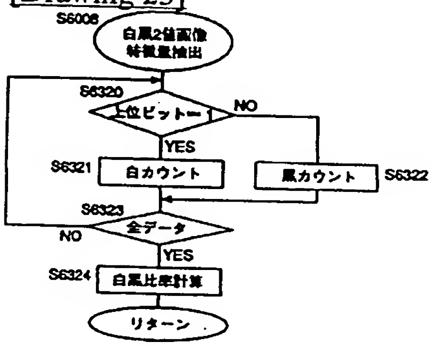

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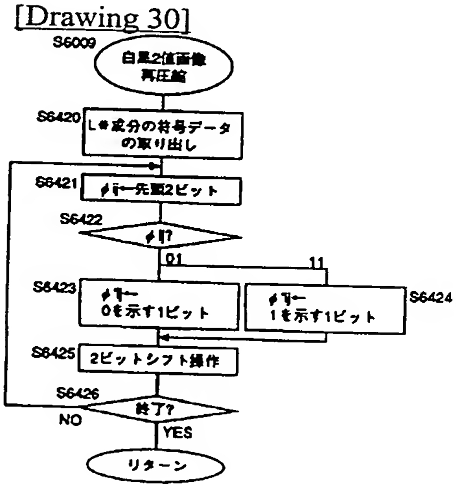

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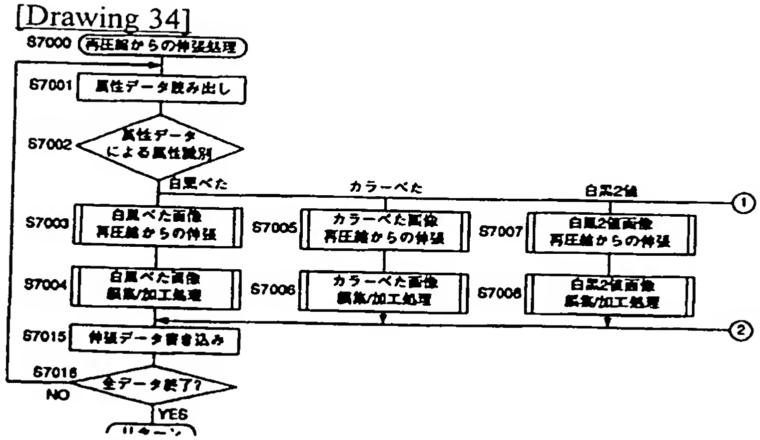

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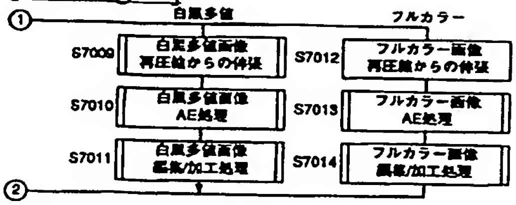

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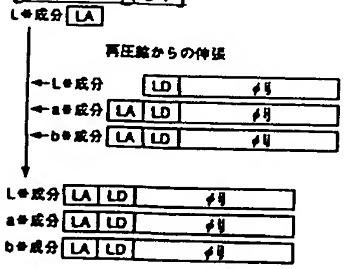

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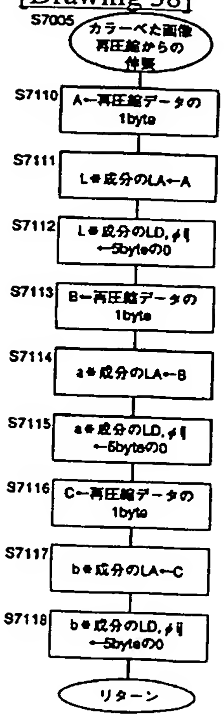

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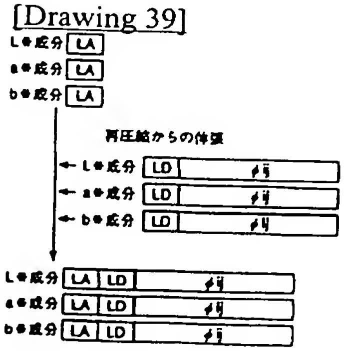

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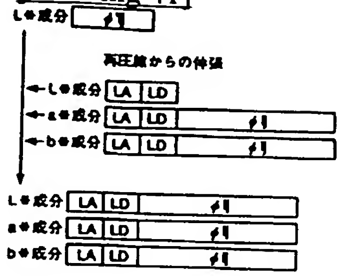

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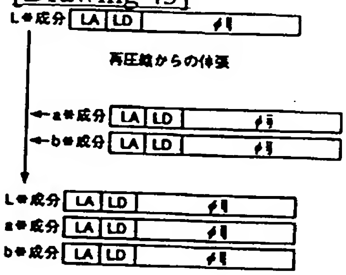

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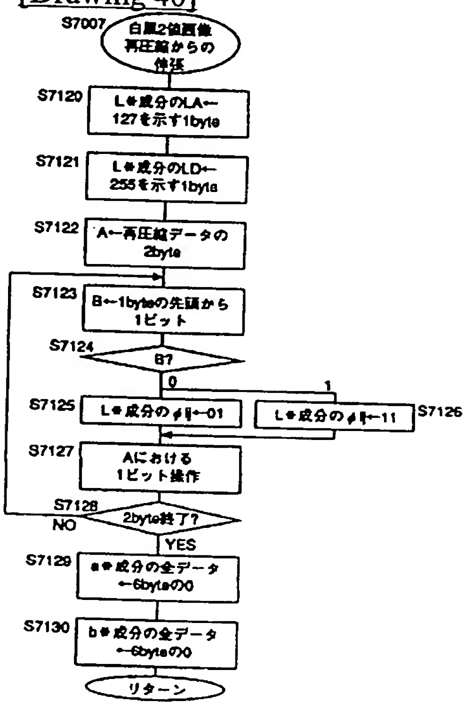

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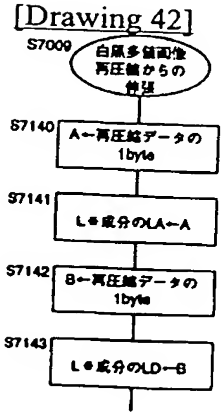

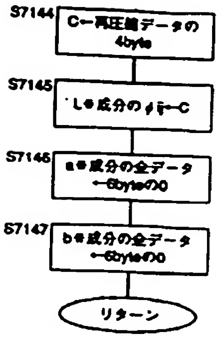

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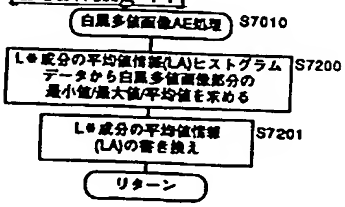

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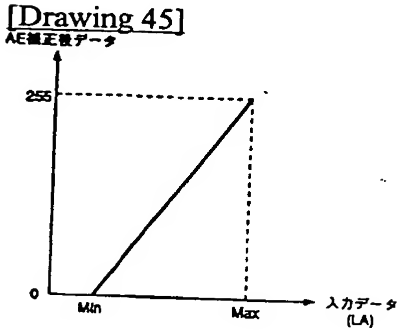

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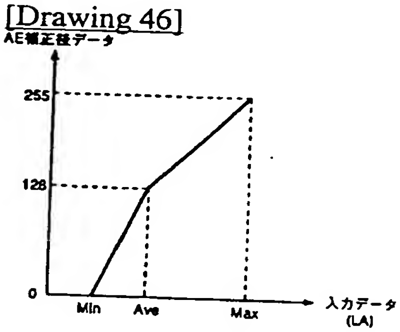

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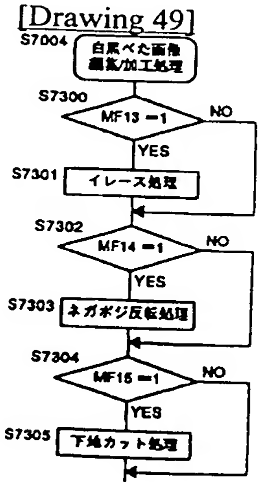

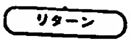

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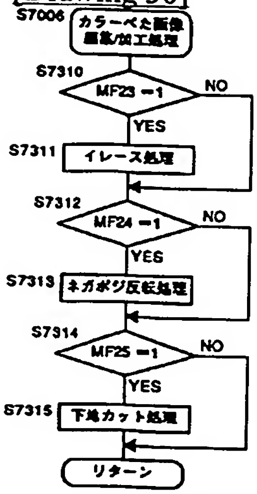

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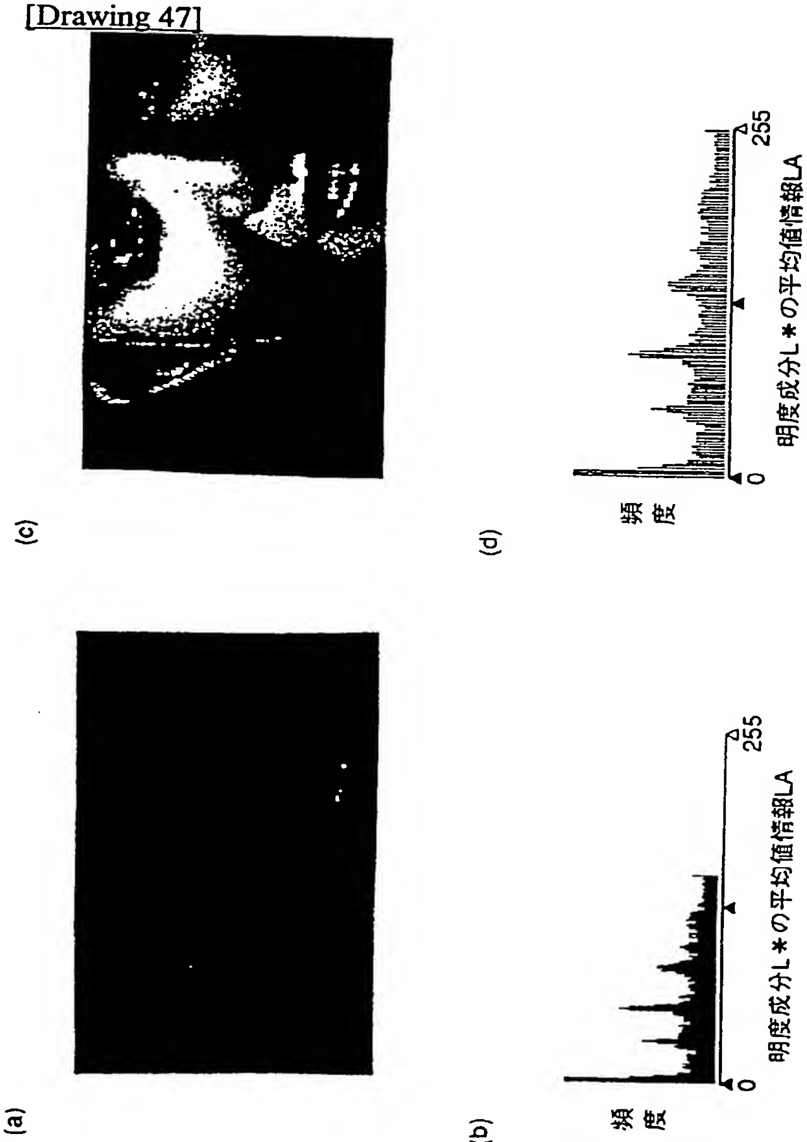

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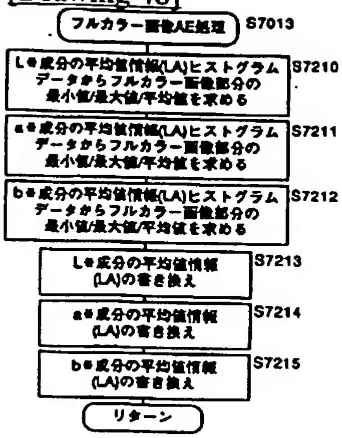

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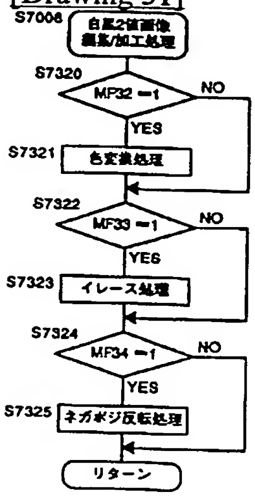

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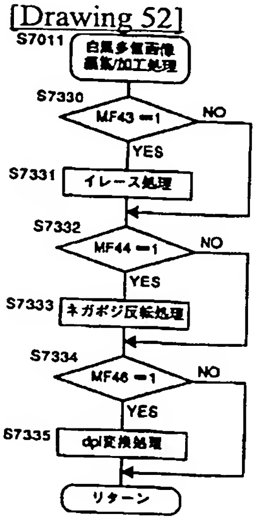

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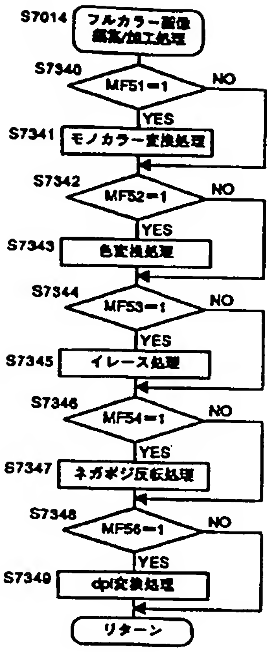

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